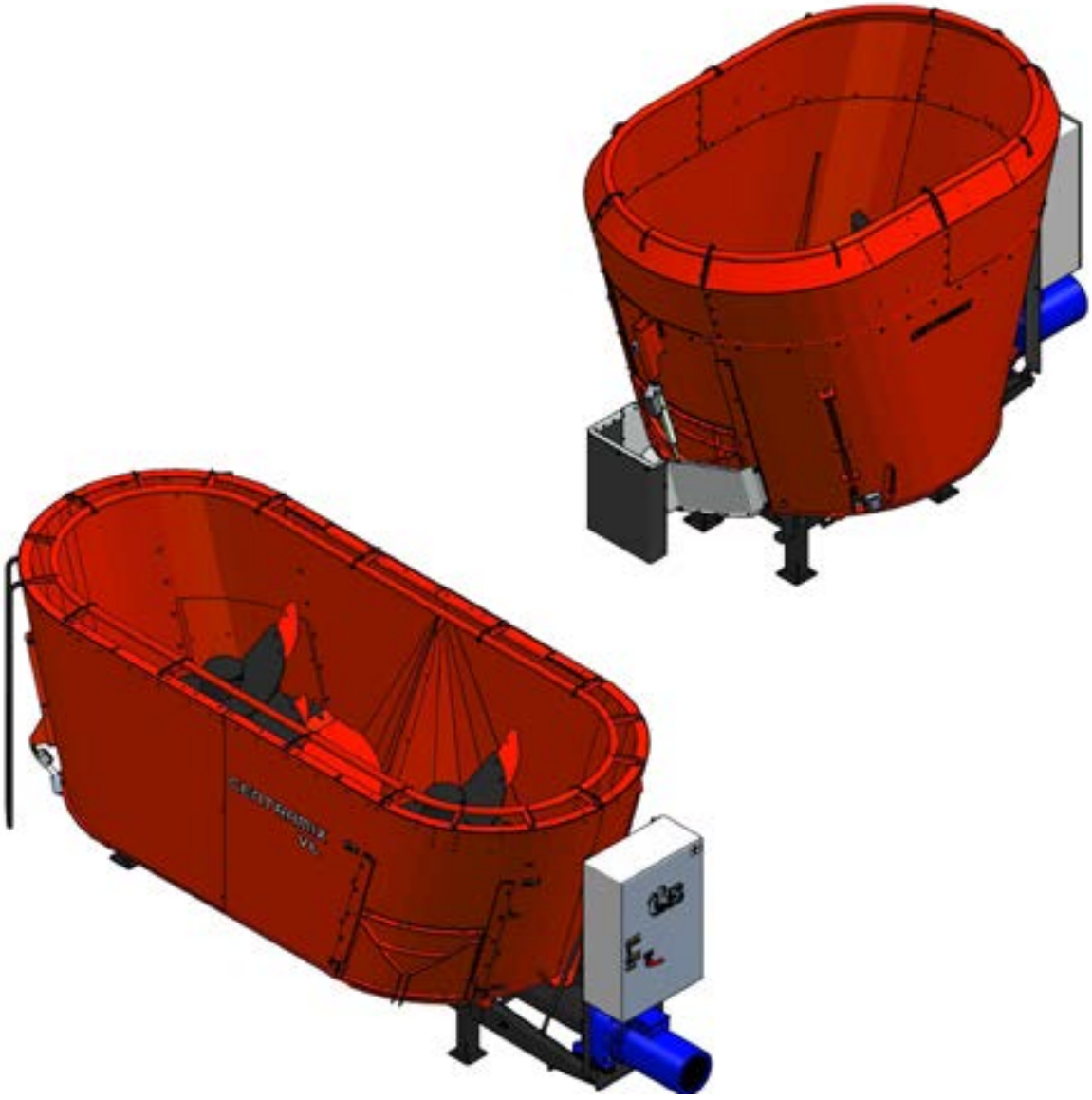
Operator's manual
TKS
Kuhn FeedMixer

From serialno.: 005 -



CE - Declaration of conformity

We,
T. Kverneland & Sønner AS,

Kvernelandsvegen 100
N-4355 Kverneland
Norway
declare that the product:
TKS Kuhn - FeedMixer

has been built in conformity with the Machine Directive 2006/42/EC and meets the relevant fundamental health and safety requirements.

Kverneland, 08 Mai 2015

Tønnes Helge Kverneland
General Manager

Enter the serial number

of the machine here :

_____

T. Kverneland & Sønner AS, manufacturer of agricultural products, reserves the right to change the design and/ or specifi cation of its products without prior warning. This does not imply any obligation to modify previously supplied machines.

Guarantee

At the end of the book you will find the warranty form, and this have to be filled out and returned to TKS

This TKS product is guaranteed against manufacturing and material defects for one year.

If the owner wishes a defect to be covered by the product guarantee, he or his representative must inform the dealer of this when ordering parts and/ or repairs. Claims must be reported within the guarantee period.
The dealer must complete a claims form for each case covered by a guarantee and send it to TKS or TKS's distributor/ importer within the 10th of the month following the one in which the defect was reported.
The defective parts shall be marked with the claim number and be kept for up to 6 months so that TKS or TKS's distributor/ importer can inspect them.
Since TKS products are used outside the manufacturer's control, we can only guarantee the product quality, and not that it will perform its function, nor are we liable for any consequential damage.
.

The guarantee is not valid if:

a) third party spare parts are used, or the product is repaired or altered without the approval of TKS
b) the operating and servicing instructions have not been followed.
c) the machine has been used for other purposes than those for which it is designed.

The guarantee does not cover damage due to normal wear and tear.
Offi cial safety regulations specify requirements that apply to the users/ owners and manufacturers of this machine, relating to the careful review of safety hazards that may arise when this type of machine is used correctly. Therefore, TKS and our importer/ distributor are not responsible for the functioning of components
that are not shown in the spare parts catalogue for this product. TKS reserves the right to change the design of the product without this implying any obligations in relation to previously supplied machines
.

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that are not shown in the spare parts catalogue for this product. TKS reserves the right to change the design of the product without this implying any obligations in relation to previously supplied machines
.

NB! It must be possible to identify all enquiries relating to this product by the product's serial number; see page 7 on Machine identification.

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Introduction

Congratulations on buying your new TKS product. You have chosen a functional, high quality product. A network of helpful dealers will be able to advise you on its use, as well as provide servicing and spare parts.
All TKS products are designed, tested and built in close cooperation with farmers and machine workshops to ensure optimal effi ciency and reliability.
Please read this instruction manual carefully and familiarise yourself with the machine‘s manner of operation before starting to use it. There are many conditions and variables that can affect the machine's functionality and manner of operation. It is therefore vital that you consider all known conditions and adapt usage according to these. A good understanding of the machine‘s manner of operation and performance, together with a high degree of knowledge with regard to feeding and feed types/consistencies will ensure the best possible result. The machine is a highly advanced feed robot that operates without the need for supervision and must be used in accordance with the applicable instructions from the manufacturer and other regulations in force at any given time.
By being thorough and making the necessary adaptations to local conditions, you will ensure the best possible results.

Yours faithfully
T. Kverneland & Sønner AS

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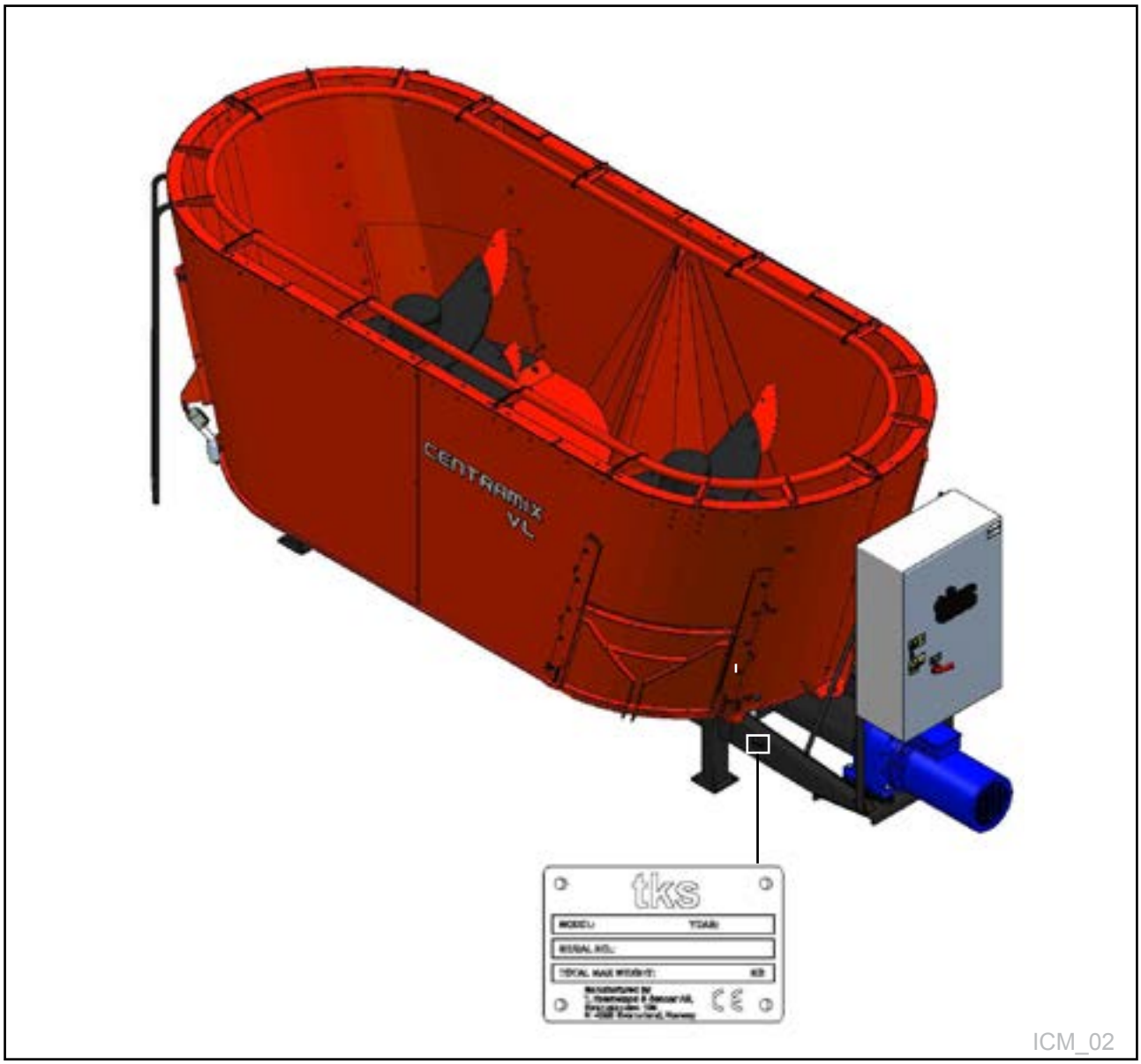
Machine identification

The machine's serial number and the address of the manufacturer are written on the machine. See the illustration on this page.
Please use the information on the name plate when making any enquiries about spare parts or servicing.
This product is CE marked. This mark, along with the associated written EU confi rmation, means that the product fulfi ls current health and safety requirements, and complies with the following directives: Machine Directive 2006/42/EC



Technical data

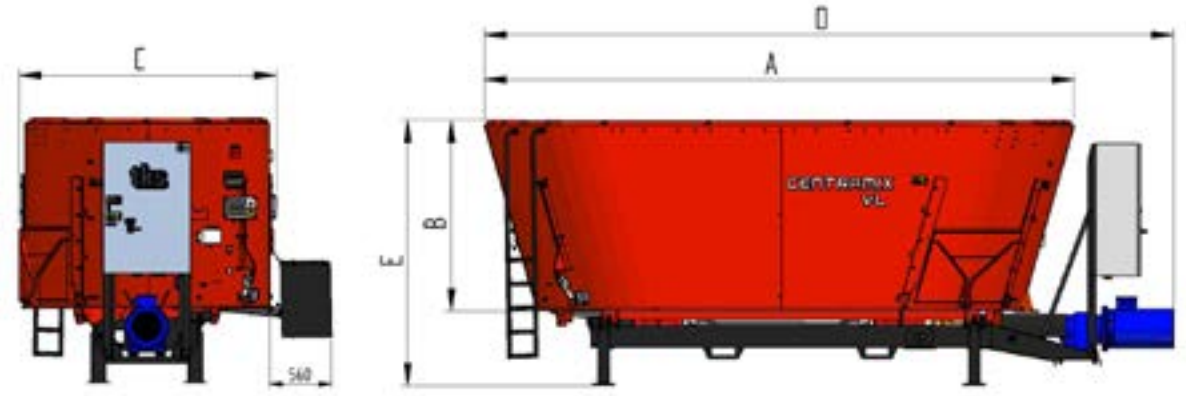
Series 80 VC

Size in m^3	Auger Type 80 VC w/end door	Lenght A	Height B	Height C	Lenght with control panel D	Height with legs E	Load Kg	Motor kW
9	1S	3325	1691	2472	4157	2466	3455	22
11	1S	3350	1973	2487	4177	2748	3550	30
13	1S	3504	2242	2472	4177	3013	3660	30
15	1S	3583	2373	2471	4187	3143	3720	37
18	2S	5707	1690	2481	6573	2368	6060	37
22	2S	5760	1973	2481	6573	2651	6190	37
25	2S	5913	2243	2481	6573	2921	6340	37
27	2S	5987	2373	2481	6630	3051	6450	45
30	2S	6168	2562	2487	6731	3240	6385	45
28	3S	7995	1975	2810	8395	2575	9000	45
33	3S	8110	2245	2740	8510	2845	9500	45
39	3S	8260	2375	2862	8660	2975	10000	55
45	3S	8335	2525	2876	8735	3125	10500	55
27	2S	5987	2373	2481	6630	3051	6440	45

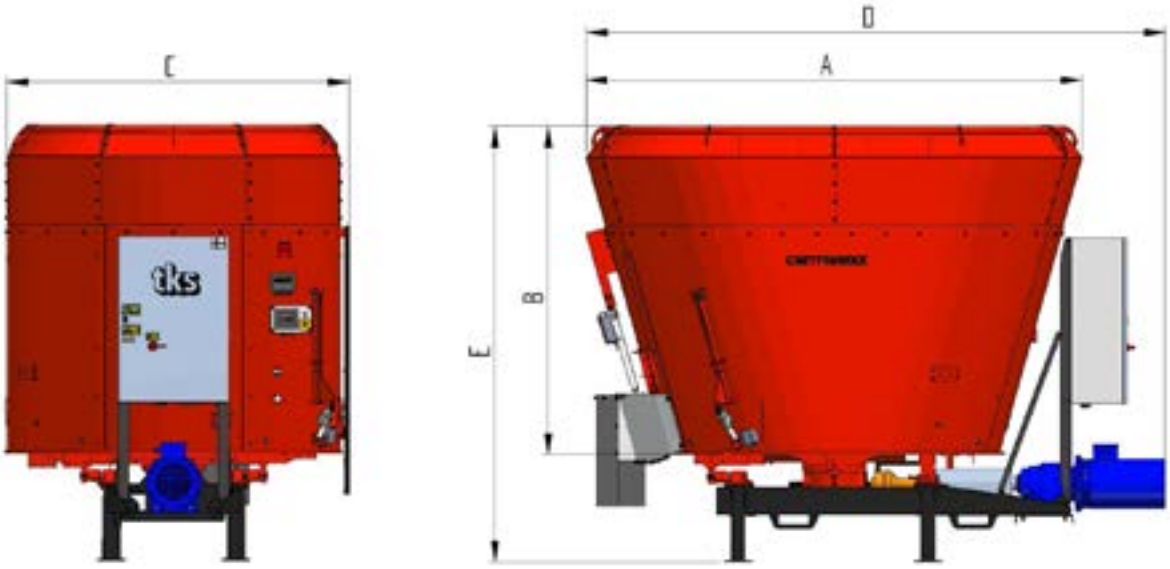
Series 70 VL

Size in m^3	Auger Type 70 VL w/side door	Lenght A	Height B	Height C	Lenght with control panel D	Height with legs E	Load Kg	Motor kW
4	1S	2760	1360	2250	3160	1960	1800	18,5
6	1S	2835	1660	2275	3235	2260	2200	18,5
8	1S	3165	1722	2324	3891	2456	2870	22
10	1S	3241	2060	2321	2952	2797	2970	30
12	1S	3381	2311	2327	4029	3042	3070	30
16	2S	5373	1710	2343	6280	2410	5560	37
20	2S	5445	2050	2343	6315	2746	5690	37
22	2S	5570	2300	2343	6385	2996	5830	37
25	2S	5913	2243	2481	6573	2921	6340	37
27	2S	2983	2378	2487	6630	3056	6450	45
30	2S	6201	2562	2487	6736	3240	6480	45
28	3S	7995	1820	2810	8395	2420	9000	45
33	3S	8110	2080	2840	8510	2680	9500	45
39	3S	8260	2380	2862	8660	2980	10000	55
45	3S	8335	2530	2876	8735	3130	10500	55

Measure - FeedMixer



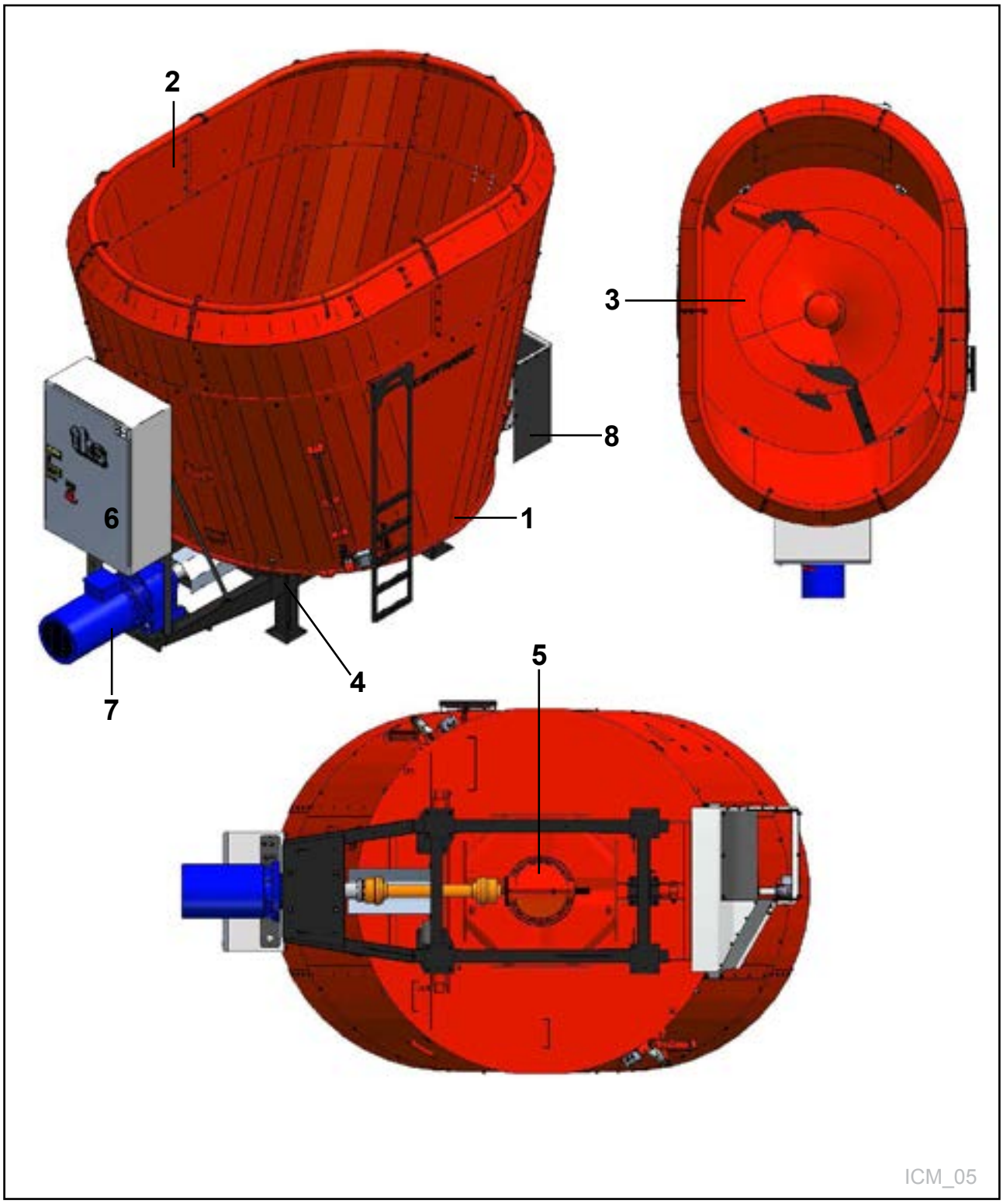
ICM_03



ICM_04

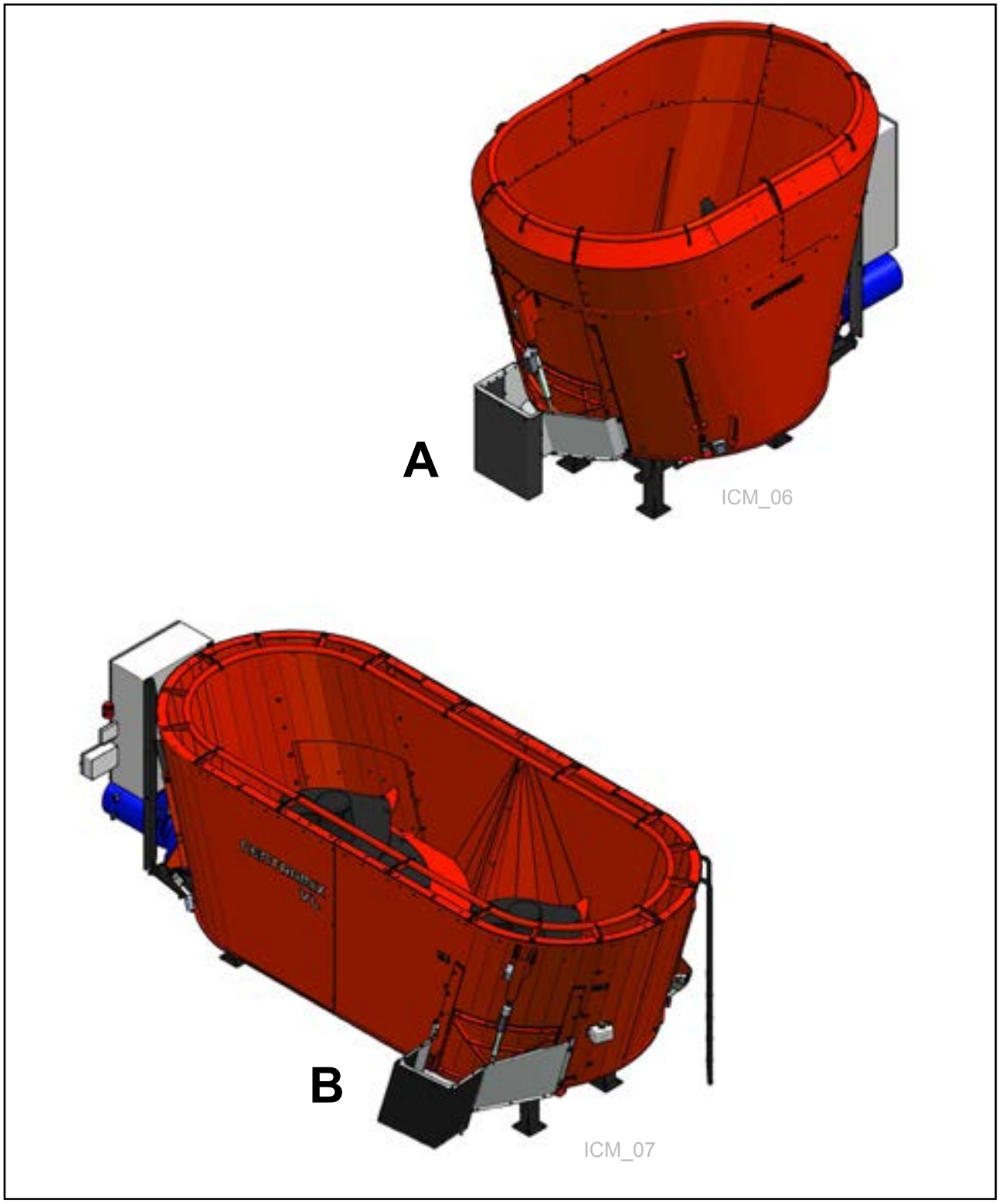
Technical description

1 = Mixing hopper
2 = Extension kit
3 = Auger
4 = Weighting cell
5 = Gear unit
6 = El. cabinet
7 = Gear motor
8 = Feedout chute
9 = Counter knives with activator



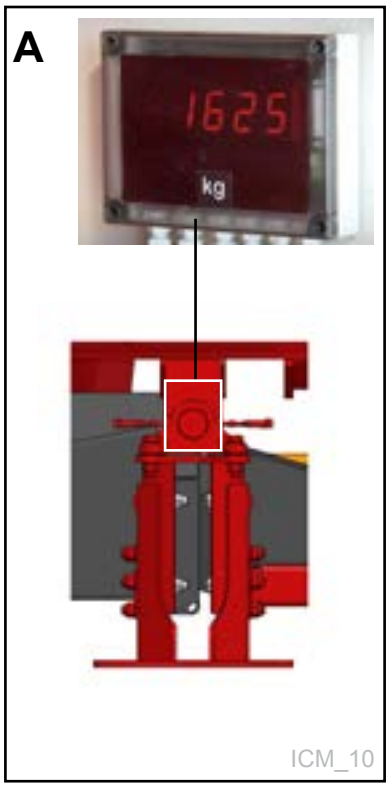
Feedout chute on FeedMixer

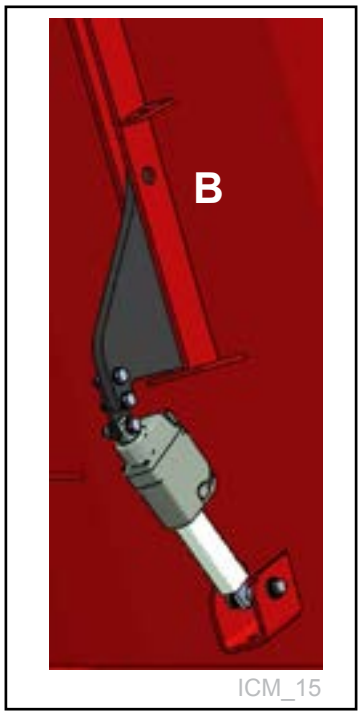
A = Feedout chute width end door, issue VC
B = Feedout chute width side door, issue VL



Fully assembled equipment

Equipment:
A Loading cell
B Counter knife with activator





Model description and area of use

FeedMixer is designed for cutting silage, round bales, square bales and most types of forage. It cuts most types of round bales and silage. The cut depends on the consistency and type of feed. FeedMixer is particularly useful for creating a good mix in a short time.
It is therefore suitable for mixing full feed, which often involves mixing feed types of very different consistency and character.
It is important that finer ingredients and smaller quantities are mixed quickly before the structure of the feed is damaged. With its powerful motor and augerdesign, you will quickly obtain a loose and homogeneous material that can be easily dispensed from all types of feed carts or belts.
FeedMixer has vertical augers that produce a fine material in which the structure of the feed is retained. It is particularly important with pre-dried material that the feed is not compressed into wet lumps. This will reduce the feed intake to the animals.

To achieve the best possible result, more time and involvement is required than "traditional" feedout methods.
The quantities of individual feed types and the duration of the mixing process must remain the same each time mixing is performed if composition and consistency are to remain uniform – otherwise feed intake and production will be affected.
All functions are electrically operated.
The counter knives are moved in position during mixing and retracted during the discharging process.
Where FeedMixer has to discharging several times a day, the door is closed between each operation.
FeedMixer can be equipped with a sensor that reset mixing time, when a new bale is loaded into the machine while mixing process initiated When weight system record loads under 200 kg in the mixer while discharging, the rotational speed increases in order to clean the augers and threw off the rest of the feed.

FeedMixer can be supplied in sizes from 4 to 45 m^3. Sizes of 8–15 m^3 are supplied with one auger, while sizes of 18–30 m^3 are supplied with two augers.
The electrical control system controls all functions, and it has been configured for operating a conveyor belt. The mixing motor is controlled by frequency inverter, enabling a soft start-up and stop.

The controller also includes measurement of power consumption, so you can keep an eye on what it costs to use FeedMixer for a day, a week or a month, for instance. An electrical stationary mixer is significantly cheaper to run than tractor-powered models.

NB: The instructions given in this operator's manual apply to standard operating conditions. Individual circumstances may arise at the premises of the user that deviate from the instructions provided here.
The need to make changes to the machines and equipment as a result of such circumstances shall not constitute grounds for making a claim against the manufacturer or supplier.

Climate, temperature, grass types, time of cutting, cutting/pressing equipment and conservation methods are some factors that may affect the functionality and performance of the machine. It is important to adapt and adjust the machine to suit local conditions in order to achieve the best possible result.

Chapter 1 describes the design of the machine and the functions of its individual components. FeedMixer is occasionally pictured with optional equipment fitted. Any optional equipment is labelled as such in this instruction manual and can be supplied at an additional cost.

Safety

Please pay particular attention to this symbol. It designates a safety risk, and describes precautions that must be taken to avoid accidents.

Before operating, adjusting or repairing the machine, the user, technician or owner should familiarise himself with the safety instructions contained in this installation manual.

General assessment

Safety at work is your responsibility!

Please read and understand these general safety instructions.

In order to be able to load the bale into the hopper, the machine must be open.
This means that people may come into contact with moving parts if they are standing in the immediate vicinity of the machine while it is in use.
Warning! Once the auger is running, never lean over the top edge of FeedMixer or enter the hopper when the machine is operating.
If the machine is placed in a sunken floor, the distance from the floor to the top of FeedMixer must not be less than 1.5 m.
It is a conditional requirement of using the machine that no one must be in the immediate vicinity of the machine during use.
In addition, in terms of machine type, FeedMixer is of conventional agricultural design and, from a safety perspective, the solutions choosen are considered to be on a par with or superior to existing products on the market.

General safety instructions

Use of the machine

The machine must only be used for the purpose for which it is designed.

Operating

The machine operator must remain at the end of the machine where the control box and the associated operating panel are mounted.

Supervision

The owner/operator must ensure that the area is sufficiently signposted and that there is no unauthorised access.

The machine's method of operation
The operator must familiarise himself with the machine's method of operation and function so that the machine can be used in a safe and appropriate manner.

Keep a safe distance
Humans and animals must be kept away from the machine when it is in operation.
Keep your distance from working, rotating and moving parts.

Think safety at work
Never climb on the machine while it is operating. When performing maintenance, the power supply must be disconnected

Warning – audio and illuminated indicator
The control system (software) has been updated for safe start-up. A built-in buzzer sounds for 30 seconds before start-up of the machine. This audio signal is accompanied by a light signal that flashes during the entire period of operation.

Protective guards
Check that all guards are in place and installed correctly. Do not start the machine until this has been done. Damaged guards must be repaired or replaced immediately.

Spare parts
For safety reasons we recommend that you only use original spare parts. The use of third-party spares invalidates the product guarantee.

Maintenance
Ensure that the machine is properly maintained and is kept in good condition. Never attempt to change the mechanical workings of the machine.

The area in which the machine is operating
Must be physically sealed off or locked to prevent danger to humans or animals.

Control panel
The power supply must be cut off before opening the panel.

Additional safety instructions

The machine is marked with a ⚠ warning signs. If these signs are damaged, they must be replaced. The order number is shown on the illustrations in this section.
Side 17 for their location on the machine.

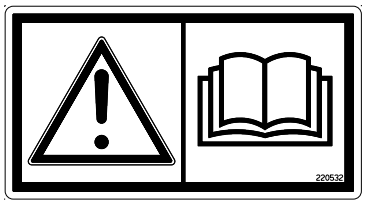


Fig. 1

Warning sign UH220532 (Fig. 1)
Be careful! Ensure that you read and understand the instruction manual before using the machine, and before making any adjustments or performing any maintenance.

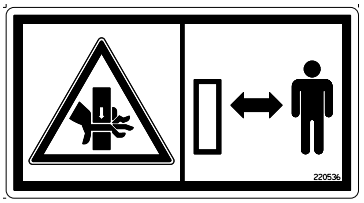


Fig. 2

Warning sign UH220536 (Fig. 2)
Risk of crushing hand.
Keep away from the bedknives.

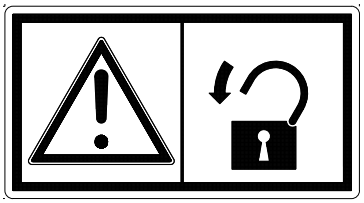


Fig. 3

Warning sign 988346 (Fig. 3)
The main power switch must be secured by a padlock.
Work should only be performed by authorised personnel.

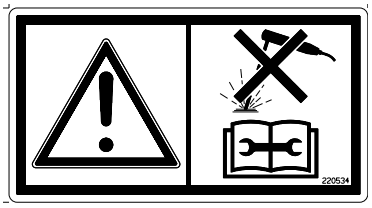
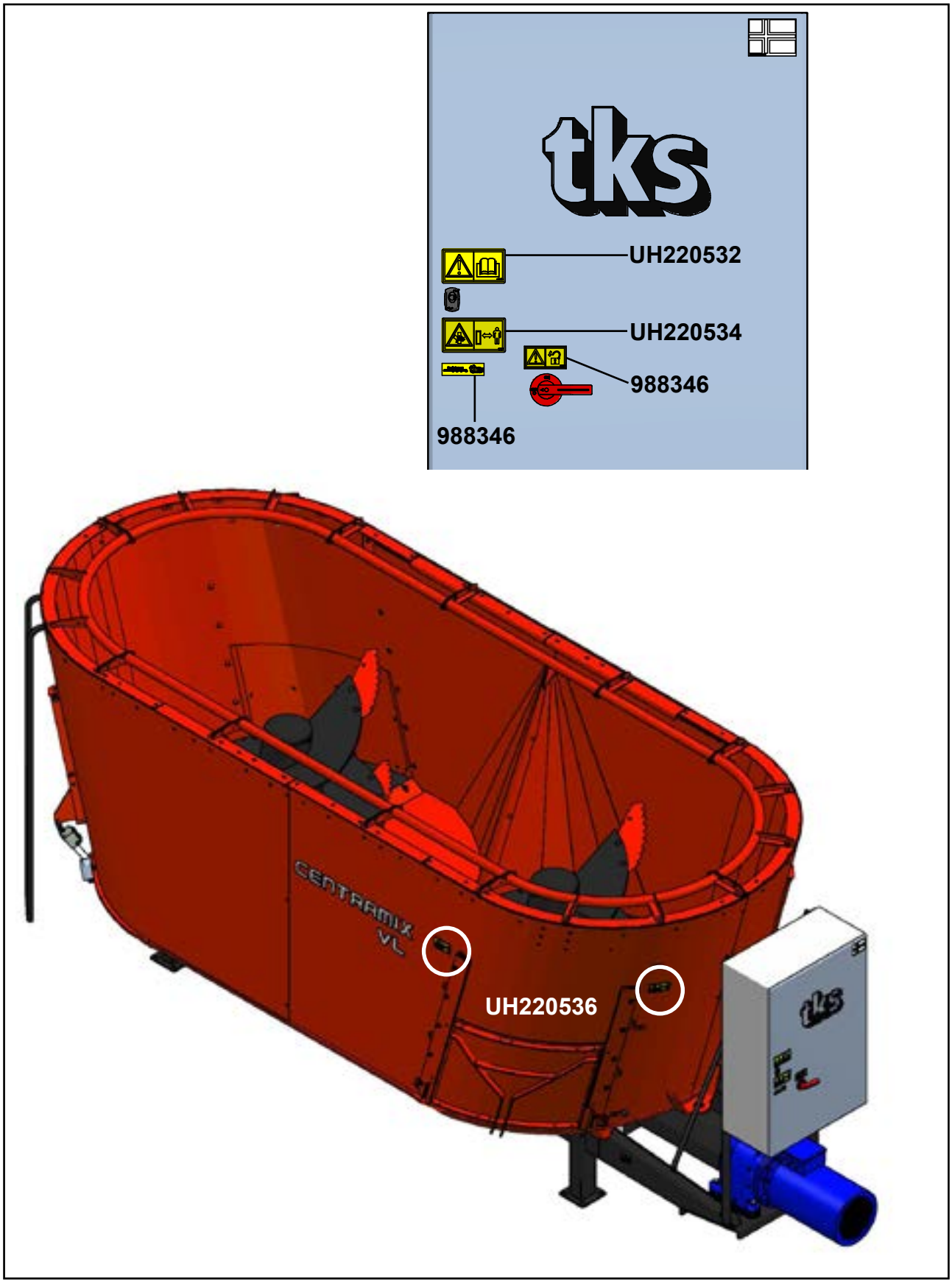


Fig. 4

Warning sign UH220534 (Fig. 4)
Disconnect all electrical connections before carrying out welding work or maintenance.

Overview of safety risks



Lifting the machine

The lifting straps are attached to the points screwed into the bottom of FeedMixer.
See Fig. 5
Use an extra strap to help keep the machine in position.

Caution!
Never stand underneath a suspended load. Any persons carrying out lifting operations must of course have the appropriate qualifications/ skills.

Be careful!
Keep your distance when moving the machine. Ensure that there are no persons underneath or near the machine during lifting.

New machine - caution

Read the operator's manual
Be particularly careful when starting a new machine for the first time. Installation faults, incorrect operation, etc. may lead to expensive repairs and loss of earnings. The TKS product guarantee does not cover damage resulting from failure to follow the recommendations contained in the instruction manual.

Please pay particular attention to this symbol. It is used to highlight important information, to help prevent incorrect installation and operation.

Pay particular attention to the following when commissioning a new machine:

- Check that the machine is correctly installed and that it is not damaged. Check to make sure that electrical cables are long enough, and positioned in such a way that they can track the movements of the machine without being damaged.bevegelser uten å skades.

Lifting point

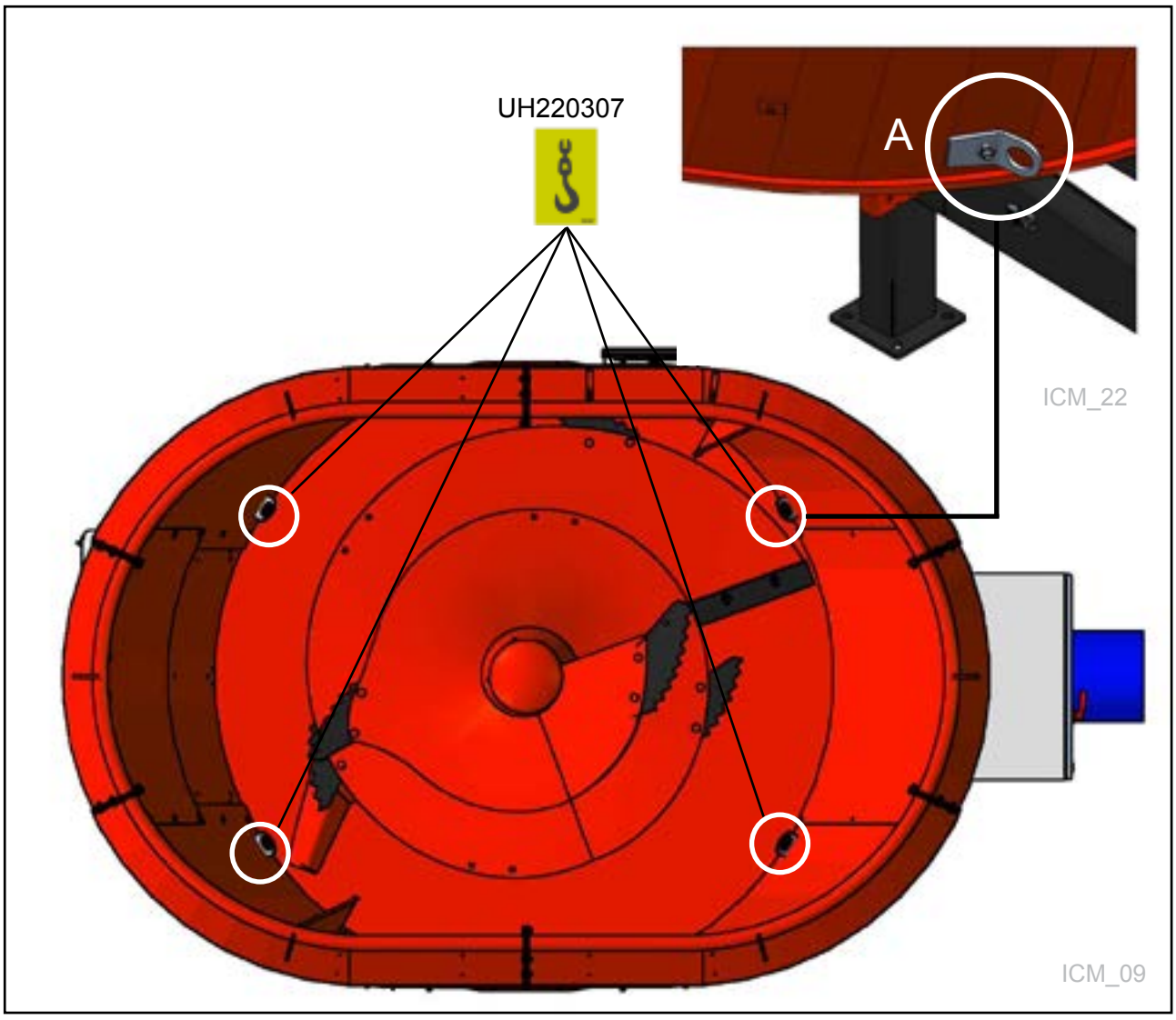


Fig. 5

Lifting point
Detach the four lifting points **(A)** after the machine is hoisted into place, and fit them to the outside of FeedMixer for subsequent use as and when needed. **See Fig. 5**

1 Function

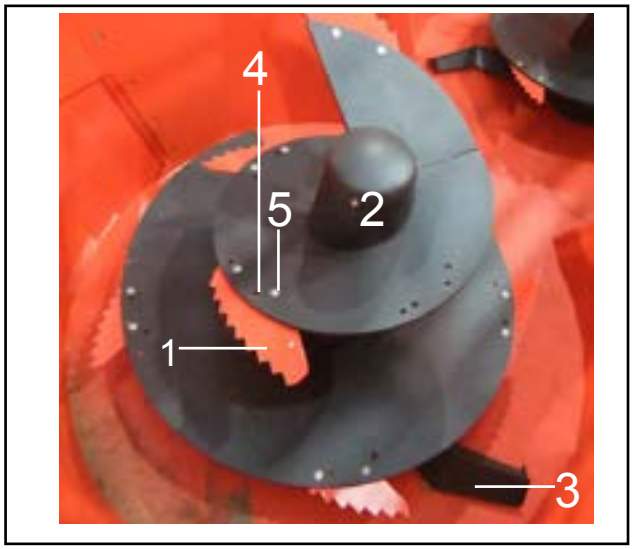
1.1 Auger

Fig. 6

There is a shear bolt connection between the layshaft and the planet gear.
If the machine becomes overloaded the shear bolt will shear, thus stopping power transmission to the auger.

During the mixing process, the auger transports the feed upwards to the middle of the mixing hopper.
The feed then falls off the mixing auger and a mixing cycle is created.

1.2 Knives



The auger **(2)**, which is equipped with knives **(1),** finely chops up the feed constituents that have been loaded into the mixing hopper.
A discharging arm **(3)** together with the blades of the auger ensure a more stable and even discharging process.
See Fig. 7

The knives on the auger can be set to an aggressive position (4) or a normal position (5). The adjustable knives allow the mixing system to be adjusted to suit individual operating conditions at the company and the structure of the feed constituents.

Aggressive = short mixing time, higher power consumption.

Normal = longer mixing time, lower power consumption.
(E.g. if the fuses are smaller)

1.3 Overflow extension

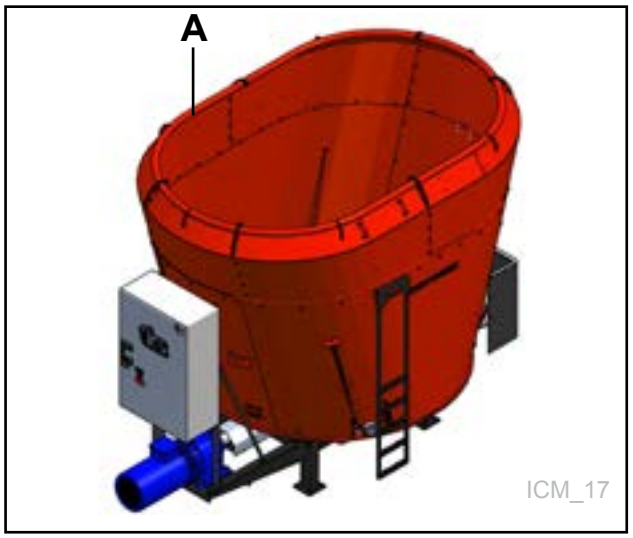


Fig. 8

The anti overflow extension **(A)** prevents feed from being thrown over the edge of the hopper during the mixing process.
The anti overflow extension prevents round bales from getting stuck while it being ground up.
See Fig. 8

1.4 Counter knives

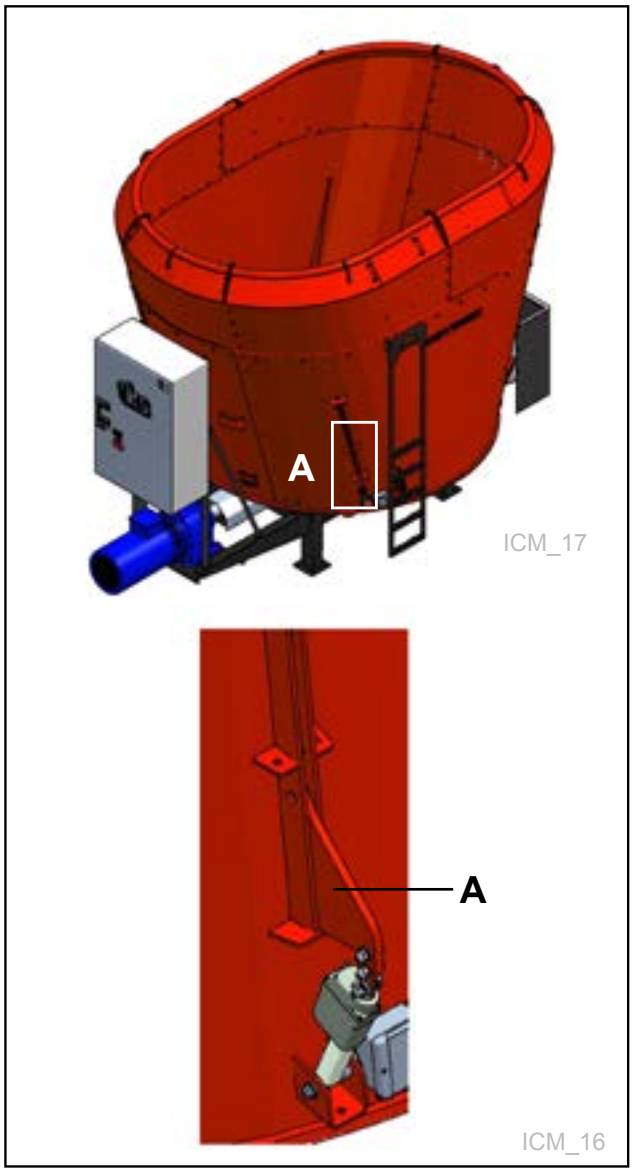


Fig. 9

A better cut is achieved by using counter knives **(A).**

Counter knives are used to prevent rotating of round and square bales for a better cut.
The counter knives move in and out automatically, depending on whether the FeedMixer is in mixing mode or discharging mode.

- The counter knives are moved at mixing mode.
- The counter knives are retracted in discharge mode.

Automatic movement of the counter knifes can be disabled. The counter knifes can be placed in the desired position – deployed, retracted, or in the midway position.
See Fig. 9

Enabling the counter knives.

See Figure 13a page 42

1.5 Door location

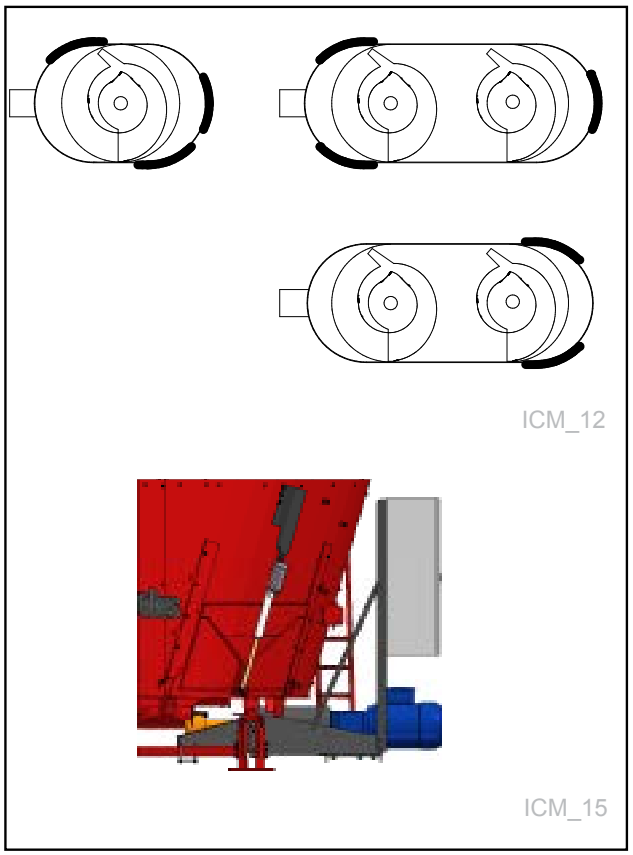


Fig. 10

FeedMixer has as standard option 3 doors. Possible optional discharge door location can be provided on request.
See Fig. 10

1.6 Ladder

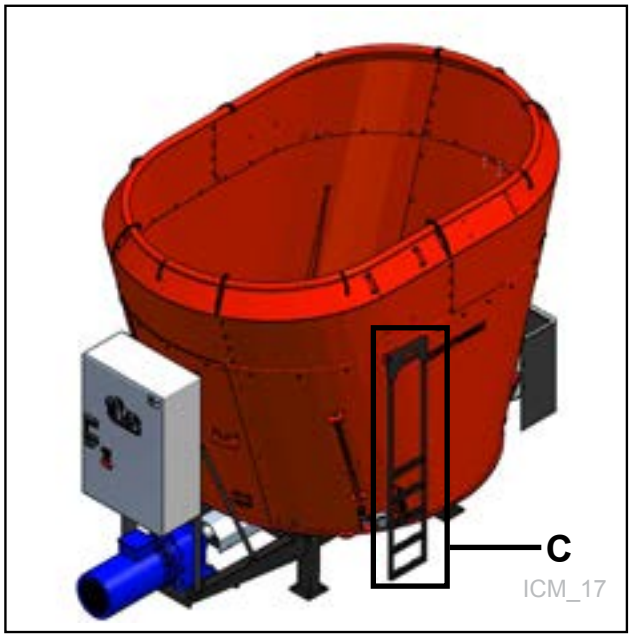


Fig. 11

Using a ladder **(C)** the operator can stand in a safe manner and keep an eye on the mixing process. If the ladder is used when discharging, an error may occur on the weight system.
See Fig. 11

1.7 Recycling
- waste to resource -

TKS's products rely on electrical and electronic components in order to work.
These fall under the generic term of EE products. TKS's products use typical components such as cables, switches, motors, control units, etc.

When TKS products are thrown away those components containing contaminants should be treated and sorted in such a way that they do not pollute the environment. Contaminants should be taken care of safely.

Distributors are obliged to accept EE waste from products in the range of goods they sell.
This waste should be kept safe and sent on to an approved waste recipient or treatment plant.
EE waste must be sorted and transported in such a way that it is not damaged or destroyed.
If you need further information on the treatment of EE waste, please contact your distributor.

TKS is a member of Renas.
(National program for the collection/treatment of electrical/electronic waste)

Regards
TKS AS

2 Positioning and installation

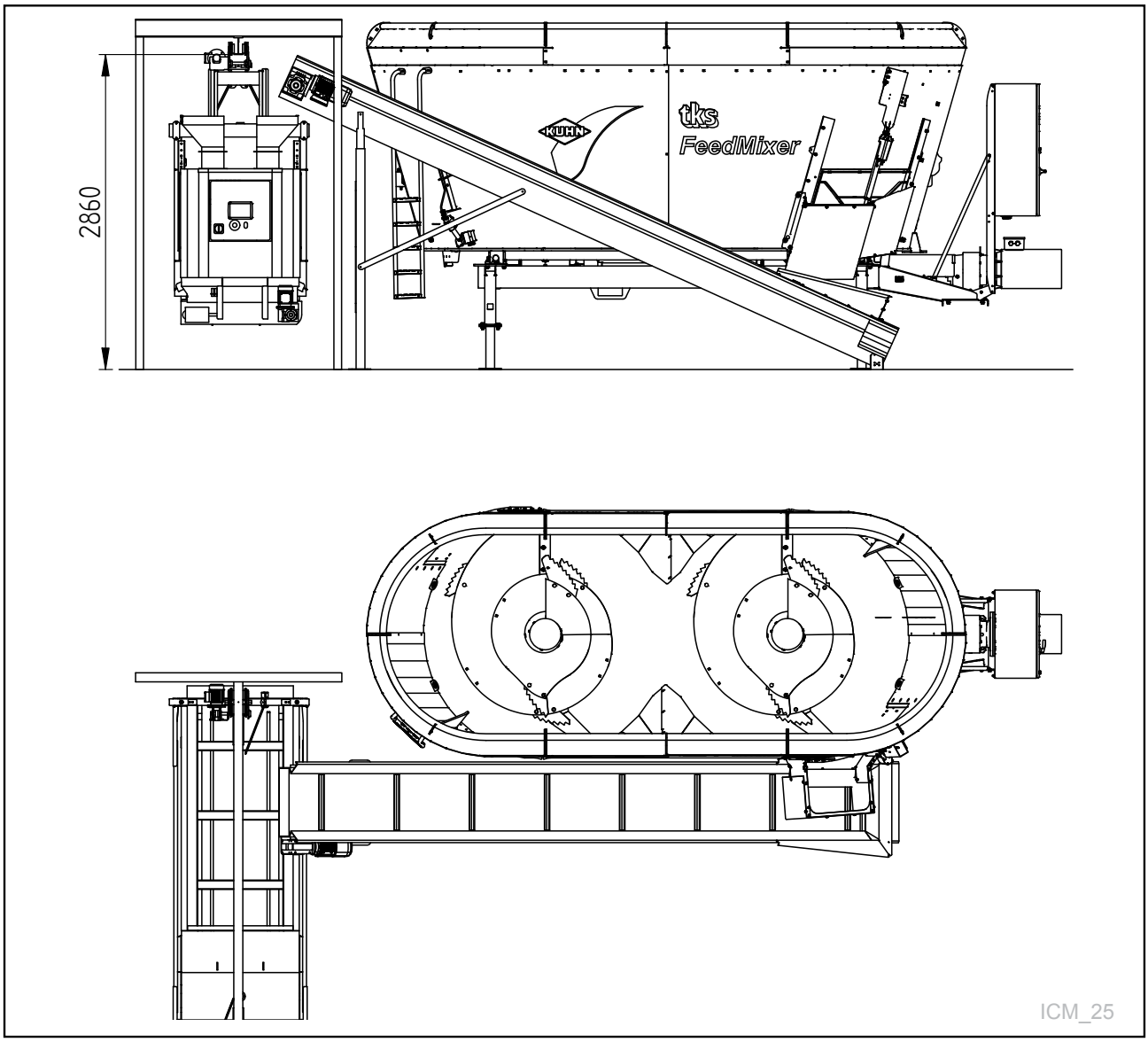


Fig. 12

NB!

Read before positioning FeedMixer:

- The surface must be designed to withstand the load of FeedMixer.
- It is important that the surface is smooth and flat leveled to ensure that the weight system can work properly.
- If the machine is placed in a sunken floor, the distance from the floor to the top of FeedMixer must not be less than 1.5 m

2.1 Installation

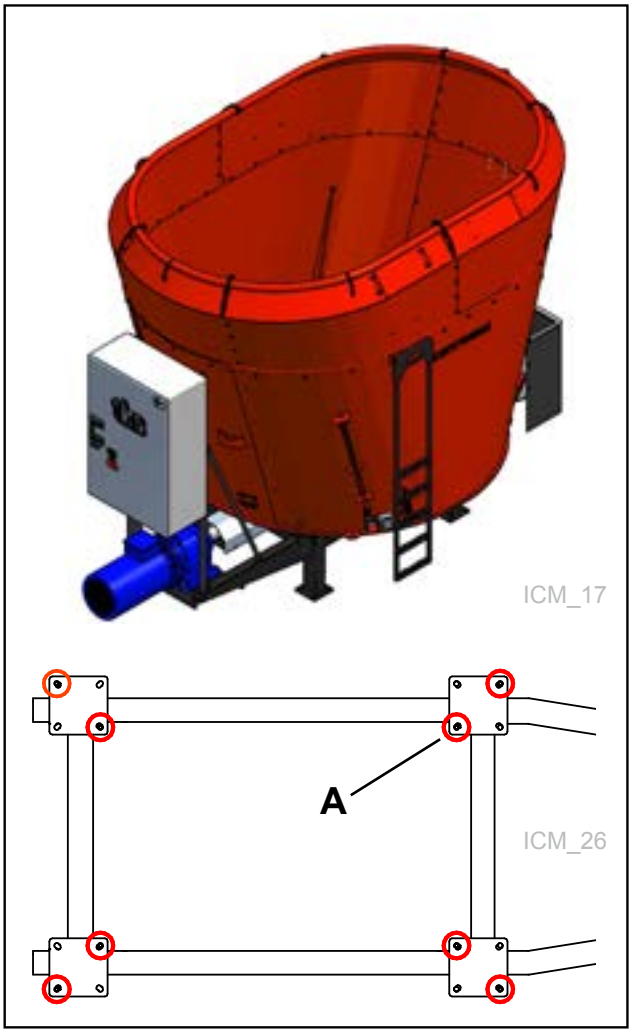


Fig. 13

- The machine is delivered assembled from TKS.
- Follow the installation instructions for FeedMixer precisely in order to avoid subsequent breakdowns.
- Remove all packaging.
- Remove equipment stored inside the machine.
- FeedMixer is secured using two expansion bolts placed diagonally opposite one another in each base plate **(A)**. These are included with the machine.
- The feeding shute for the door is flat-packed with associated bolts, and must be fitted in front of the door.

Important!

- All wiring for FeedMixer is performed at the factory by TKS.
- The power supply cable must be fitted by an authorised electrician.
- To achieve optimal operation, the power supply must have uniform and correct voltage in all phases. Fuses and cables must be adequately dimensioned.

Se Fig. 13

2.2 Check gear oil level

Fig. 14

- After installation and before FeedMixer has been commissioned, all the lubrication points on the driveshafts must be lubricated.
- Check the gear oil level in the oil tank. The level must not be below the mark **(A)** on the oil tank.

See Chap. 7 on Maintenance and inspection

2.3 Function check

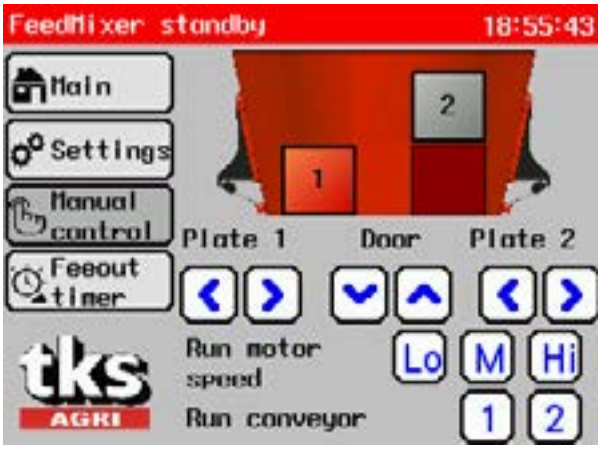


Fig. 15

Important!

- Be careful when starting FeedMixer for the first time.
- Check all the functions on FeedMixer
- The functions are tested from the display
- Open manual control in the menu
- Press and hold the keys for the various functions

See Fig. 15

See Chap. 5 on Operation

2.4 Remote control of the feedout process

When using FeedMixer together with an automatic feeding machine, separate pieces of electrical equipment must be connected. This equipment can either be a photocell a limit switch, or a radio transmitter and receiver.

Connection must always be carried out by an authorised electrician.

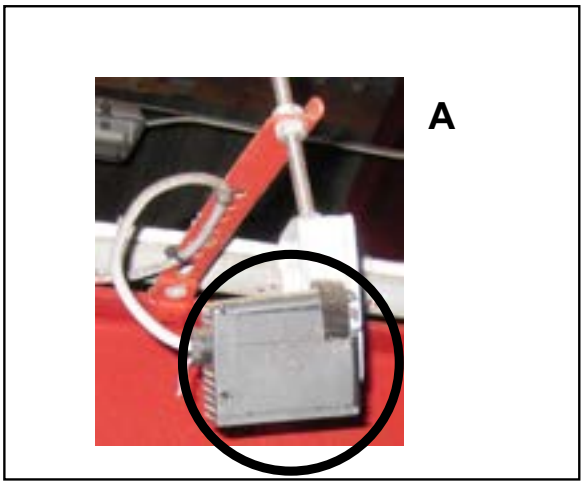


Fig. 16

Photocell

The photocell is mounted on an I-beam.
See Fig. 16

Function:
The limit switch measures the fill level in the feed cart or wagon.

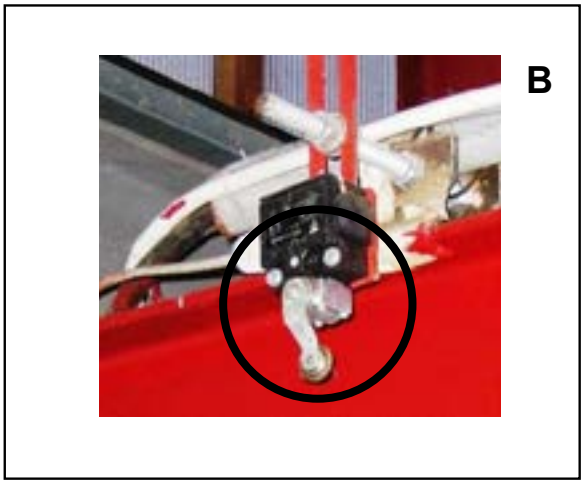


Fig. 17

Limit switch

The limit switch is fitted to the rail
Activated by the feed cart or wagon

See Fig. 17

Function:
The limit switch gives a signal when the feed cart or wagon is in position ready for filling.

3 Using FeedMixer

Dangerous situations may occur if components fail as a result of overloading FeedMixer!
The maximum payload of FeedMixer and the loading sequence for individual feed constituents must be observed

There is a risk of crushing and entrapment with subsequent risk of injury if you come into contact with any of the machine's moving parts.

Warning!

- **Once the auger is running, never lean over the top edge of FeedMixer or enter the hopper.**

Overloads may occur and blockages may be created if feed constituents get stuck on the counter knives.
Overloads reduce the performance and life time of FeedMixer.
The TKS warranty does not cover damage caused by overloading.

3.1 Loading

FeedMixer may only be loaded using suitable tools such as:

- Tractor with front loader/wheel loader
- Conveyor belt
- TKS Magazine R2
- TKS FeedHopper/FeedHopper Junior
- Crane

Important!

- When loading FeedMixer, carefully drop the feed from the lowest possible height inside the hopper.
- Dropping heavy loads from high heights may damage the equipment and is not covered by the warranty.
- Make sure that the feed does not stick to the edges of the hopper during loading.
- The hopper should ideally be loaded in front of or behind the auger, i.e. not in the middle just above the auger.
- With ideal loading it speeds up the mixing process, and it use less power.

3.2 Loading sequence

Light, dry feed is loaded first, before loading heavier, wetter feed.

Loading the bales

- Load the driest, lightest bale first.
- Wait for the bale to be ground up and cut into an even mixture before loading the next bale.
- Heavier, wetter bales (and any frozen bales) are loaded at the end.

We recommend consulting
a feed consultant to achieve the best possible mixture and optimal use of raw materials.

- Highly structured feed constituents (hay, straw etc.) should be loaded with the auger rotating.
- The mixing process can be left to run for a few minutes before adding the next constituent.
- Concentrated feed, and minerals should be loaded with the auger stationary.
  A stationary augerincreases the accuracy of the scales.
- Forage, maize and heavier feed constituents are added later during the mixing process with the augers rotating.
- Feed constituents with a higher water content, e.g. scraps, potato peel or turnip, are added toward the end of mixing process.
- Liquid feed constituents such as molasses and water are added at the very end.

3.3 Feed quantities

The loading quantity for a FeedMixer may vary due to the different feed constituents being loaded. The loading quantity depends on the following factors:

- The volume of the mixing hopper
- The dry matter content of all the feed con stituents
- Structure and straw length
- Order of loading

3.4 Mixing

The type and structure of the feed constituents being used, along with the desired cutting length of the feed mixture, determine the duration of the final mixing process.

- The mixing process will use longer time when using structured feed constituents.
- The counter knives slow the circulation of the feed in the mixing hopper. The further the counter knives are inserted into the mixing hopper, the braking effect gives better charging and mixing effect.
- The counter knives should be used to ensure good cutting of round and square bales.
- Blunt knives increases power consumtion power, for which reason the knives should be sharpened regularly.

See Chap. 7 on maintenance.

3.5 Warning sounds

- FeedMixer gives audio alerts for functions during loading.
- If too much feed is loaded into the hopper, FeedMixer will give an audio signal indicating that the motor is operating at maximum load. No more feed must be loaded.
- The audio signal persists for as long as the motor remains under such strain.
- Two short "beeps" – 5 seconds pause between sounds.
- If more than 200 kg of feed are loaded after the mixing process is started, a new mixing time is activated. This requires that automatic reset of the mixing time has been enabled. **See Chap. 5.3.1**
- Two long "sounds"

4 Using the screen and PLC

4.1 Screen

The control system has a touchscreen, meaning that you can control it by touching the screen directly. Touch the screen with your fingers or use a soft-touch stylus located in the control cabinet.
Do not press too hard, as this can damage the screen.
If the screen has not been active for a few minutes, it will enter screen saver mode.
The screen will be off in this mode. Touch any part of the screen in order to reactivate it.
The menu keys are displayed on the left-hand side of the screen. Close windows by pressing the X in the upper right-hand corner to go to the Home screen.
NB! Clean the screen using a moist cloth.

4.2 Numeric keypad

Fig. 19

Values in fields with blue borders can be changed. Touch the number and a numeric keypad will display on the screen.
The top of the screen shows the Max/Min value that can be entered in this field.

Enter a new value using the number keys.
If an incorrect value was entered, press the <— key and delete the most recently entered number. Press **CLR** to delete everything.

To enter a negative value, press - before entering the value.
Once you have selected a value, press the **ENTER** button.
This will save the value and close the keypad window.

To cancel, press **X** in the upper right-hand corner. The old value will continue to be active.
To enter times in the feedout schedule window, begin by entering the hours – then press period. Then enter the minutes.
Make sure that the time is right.
For example, if you enter 12:65, this will be ignored – enter 13:05 instead.
See Fig. 7

4.3 Selecting a value

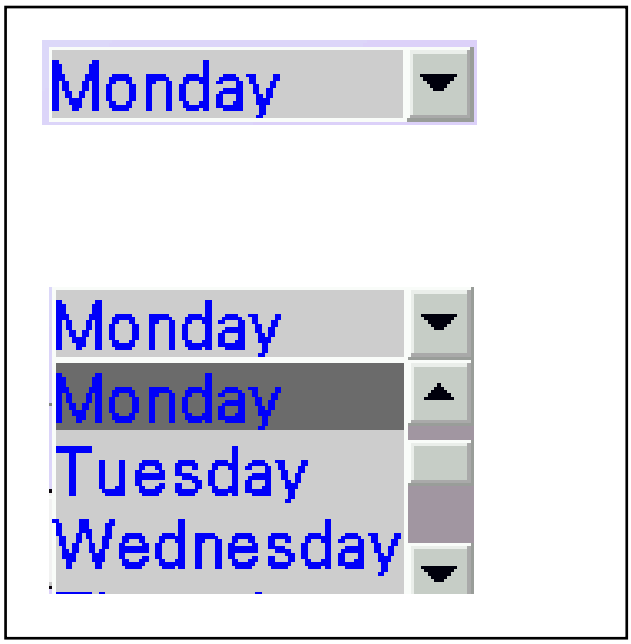


Fig. 20

Selecting pre-programmed values from a list.

- Open the list – Press the value or the down arrow
- Select a value from the list

See Fig. 9

4.4 On / off key

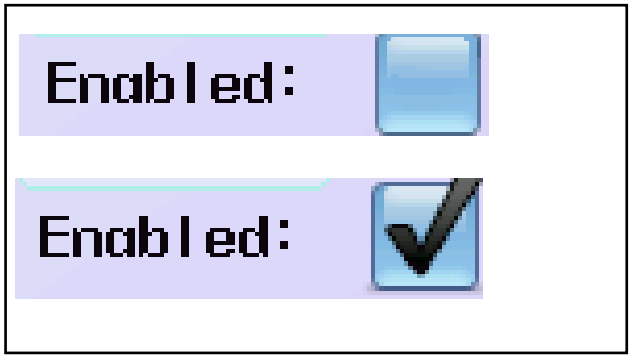


Fig. 21

Enable or disable a function using the on/off key.

- Unchecked means off, disabled
- A checkmark means on, enabled

See Fig. 10

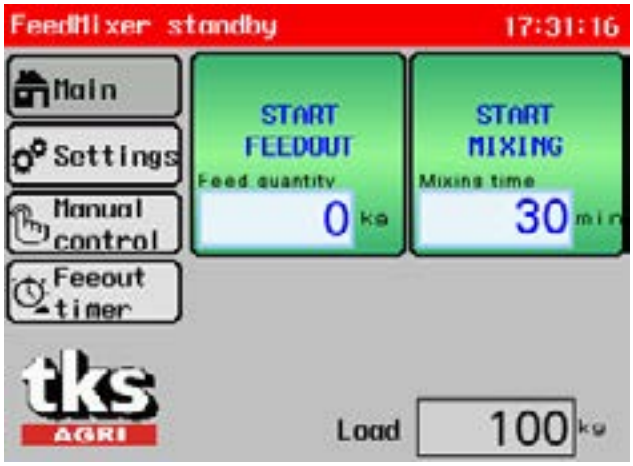
5 Operation
5.1 Activate FeedMixer

WARNING!
The operator is responsible for the safe operation of the machine. Before using FeedMixer, please read operator's manual. Make sure it is safe to use the FeedMixer. Press and hold ACTIVATE FEEDMIXER button for 3 seconds to activate machine
ACTIVATE FEEDMIXER

Picture 1

When FeedMixer is switched on, or when the emergency stop button is pressed, screen picture will display.
Read the instructions on the screen and make sure that the machine can be used properly.
Release the emergency stop button if it has been tripped.
Press **"ACTIVATE FEEDMIXER"** and hold it down for three seconds before Home screen appears.

5.2 Menus

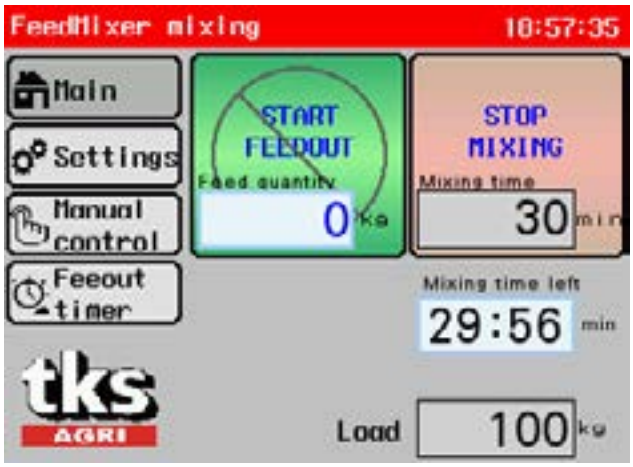


Picture 2

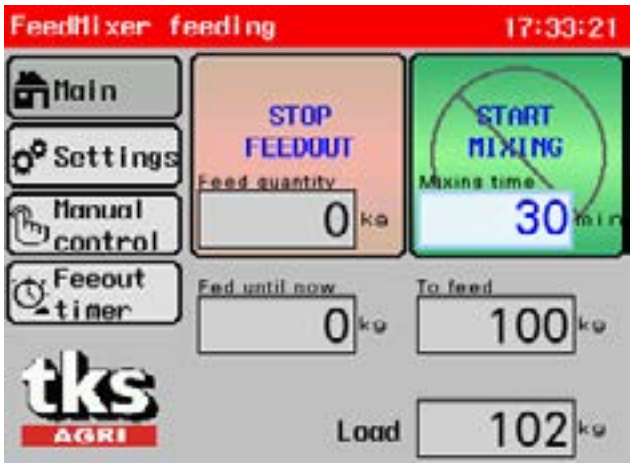
5.2.1 Home

When FeedMixer is activated, the Home screen displays. The following displays:

- Menu on the left
- Start keys for mixing and feeding on the right
- The load of the content in the mixer is shown at the bottom
- The current menu selection is indicated by a key highlighted in dark grey
- The red line at the top shows FeedMixer activity and the clock time



Picture 3



Picture 4

5.2.2 Perform a mixing operation

- Load FeedMixer with feed.
- **Load** shows the number of kg loaded material.
- Adjust desired **Mixing time** in the field at the **START MIXING** key
- Enter the number of minutes and then press Enter
- Press and hold the **START MIXING** key for three seconds
- The motor goes through its start-up sequence and mixing begins.

Once mixing has commenced, the **START MIXING** key changes to a red **STOP** key.
Below the keys is a field with a **Mixing time left** It can be changed if desired.
The **START FEEDOUT** key is locked, but the number of kilograms to be dispensed can be changed. Once mixing is complete, FeedMixer stops on its own and the screen displays two green start keys.

5.2.3 Perform a feedout operation

After mixing, a feedout operation can be started In the field on the **START FEEDOUT** key, enter the **Feedout quantity** in kg.

Press and hold the **START FEEDOUT** key for three seconds, FeedMixer begins the feedout sequence. The door opens, the counter knives retreats, the conveyor starts and the feed discharges.

Once the feedout operation has commenced, the **START FEEDOUT** key changes to a red **STOP** key. Two fields display below the keys. The first field shows the quantity discharged so far in kg, and the second shows the quantity for this feedout session in kg.
The **START MIXING** key is locked, but the **Mixing time** can be changed.
Once the feedout operation is complete, FeedMixer stops on its own and the screen displays two green start keys.

To empty FeedMixer completely, enter 0 kg in **Feedout quantity** before commencing the feedout operation.

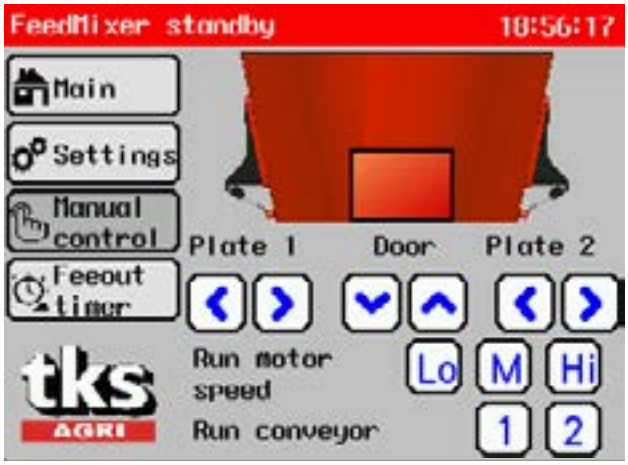
Picture 5

5.2.4 Settings

Open the settings using Settings in the menu. Eight sub-menus display for FeedMixer settings:

- Mixing – settings for mixing
- Feedout – settings for feeding
- Activation – settings for remote control
- Load – settings for the weighing system.
- Options – settings for the motor and equipment
- Energy log – energy consumption and hour meter
- Clock – setting the time and date
- Language – select display language

The program version of the PLC is displayed at the bottom: PLC 1.50 and screen: HMI v1.50



Picture 6

5.2.5 Manual control

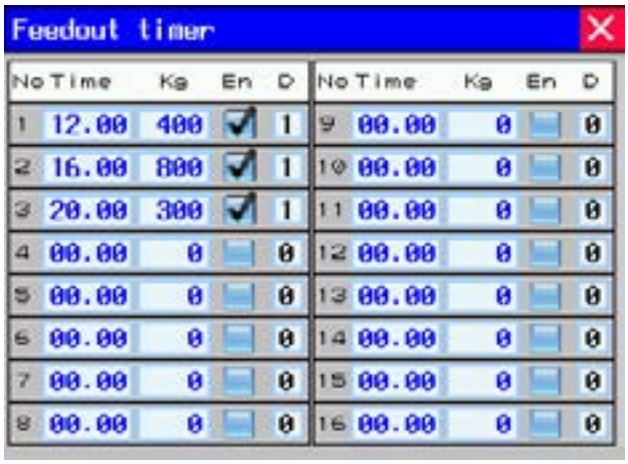
Open manual control by touching Manual in the menu.

Operation of the door

- Open the door using the up arrow
- Close the door using the down arrow
- The door is operated when the arrow key is pressed, and stops when the arrow key is released
- The arrow key lights up green on activation
- The door stops once the end position is reached
- The door also moves on the screen

Operation of counter knives (Plate 1 or 2)

- Counter Knife 1 is moved in position using the right arrow key. (Plate 1)
- Counter Knife 1 is retracted using the left arrow key. (Plate 1)
- Counter Knife 2 is moved in position using the left arrow key. (Plate 2)
- Counter Knife 2 is retracted using the right arrow key. (Plate 2)
- The arrow key lights up green on activation
- The counter knives stops once the end position is reached



Picture 7

Operation of motor

- In manual operation, the motor rotates in the forward direction.
- Start motor at pre-defined speeds
- **Lo** = low speed
- **M** = medium speed
- **Hi**= high speed
- The motor runs for as long as the key is held down, and stops when it is released.
- The key lights up green on activation.

Operation of conveyors

- **Two conveyors can be operated individually.**
- **1** – operates conveyor 1
- **2** – operates conveyor 2
- The conveyors run for as long as the key is held down, and stop when it is released.

5.2.6 Feedout timer

Open the schedule using **Feedout timer** in the menu. FeedMixer can be set to discharge automatically according to a schedule.
Up to 16 different times can be configured individually.
It's appropriate to use this function if a feeding machine does not have a separate feedout schedule program.

- Configure the desired feedout time.
- **See Chap. 4.2** for how to enter the time
- Enter the feed quantity in **kg** for each time
- Enable this feedout session using **En**
- **D** – shows the feedout door

When at least one feedout session is enabled, the **feeout timer** key on the **Home** screen will be green.

When automatic feedout is used, the feed must still be mixed manually. Mixing must be performed at a time between two automatic feedout sessions.
If FeedMixer is empty when feeding, FeedMixer will stop and give a screen alert.

5.3 Settings

Picture 8

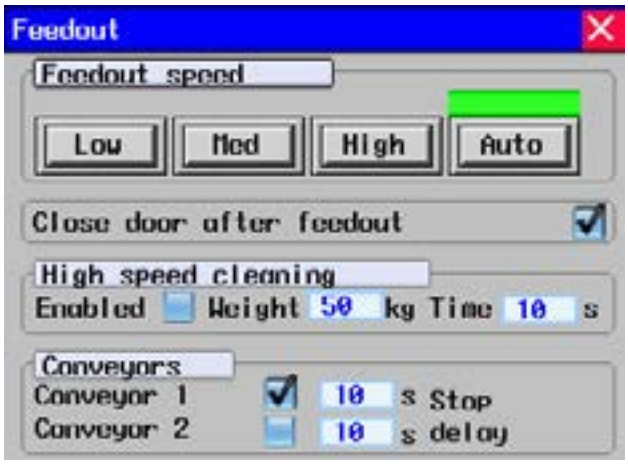
5.3.1 Settings for mixing

Choose mixing speed by setting a predefined motor speed.

- **Low – Low**
- **Med – Medium**
- **High – High**
- **Auto –** Automatically adjusts the engine speed between low and high. FeedMixer always adjusts to the lowest load.

When new material is loaded into FeedMixer, the load will increase. You can choose to start the mixing process from the beginning. Specified mixing time starts decounting from set point.

- Enable/disable – **Automatically reset mixing time after FeedMixer is loaded.**



Picture 9

5.3.2 Settings for feedout

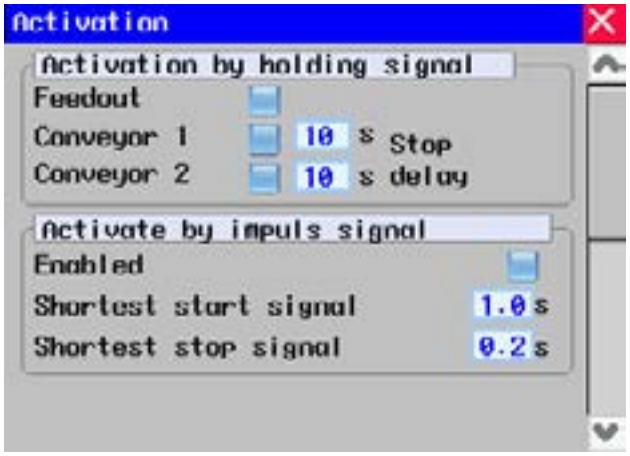
Choose a feedout speed by setting a predefined engine speed.

- **Low – Low**
- **Med – Medium**
- **High – High**
- **Auto** – Automatically adjusts the engine speed between low and high. FeedMixer always adjusts to the lowest load.

When FeedMixer is used together with FeedRobot or FeedBelt, the feedout speed must be set to **Medium** or **Low**.
This is important in order to achieve an even feeding process.

If feed is disharged at a small quantity and FeedMixer is not fully emptied each time, the door can be left open until the next feedout session. When FeedMixer is completely empty, the door closes automatically in order to be ready for the next loading.

- **Close door after feedout** – Enable/disable.



Picture 10

High-speed cleaning

- This function causes the motor to operate at a high speed to eject any feed left on the auger. After the set time, the motor speed is reduced, and FeedMixer feed out the remaining feed
- Enable/disable.
- Enter remaining load in the FeedMixer when cleaning has to start.
- Enter the duration of cleaning: 1–10 seonds.

Conveyor

It is possible to connect up to two conveyors to FeedMixer. The conveyors start each time discharging, and stop after the specified length of time when the auger has stopped.

- Enable conveyor.
- Specify stop delay (time for emptying the conveyors)

5.3.3 Settings for activation

Activation by hold signal

FeedMixer can start the feedout process in response to external signals given by feeding machines. The start signal must be an active signal the entire time the feedout is in progress. This refers to a hold signal.

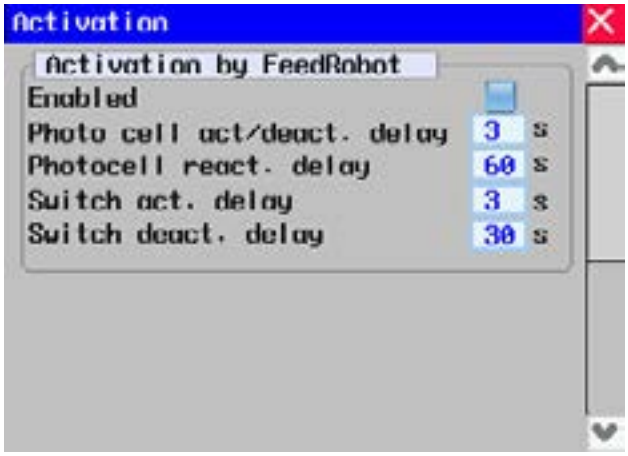
When the signal is interrupted, the feedout process stops.

Feedout and the conveyors can be controlled independently of one another.

- Feedout – enable/disable (circuit diagram -X3:1)
- Conveyor 1 enable/disable (circuit diagram -X3:3)
- Conveyor 2 enable/disable (circuit diagram -X3:3)

Conveyors 1 and 2 start at the same time, but may have different stop times configured.

Adjust stop delay.



Picture 11

Activation by pulse signal

FeedMixer can start the feedout process in response to machines with a pulse signal. This means that FeedMixer starts with one signal and stops with another.
In order to prevent FeedMixer from starting in response to the wrong signal, the signals must have a minimum duration.

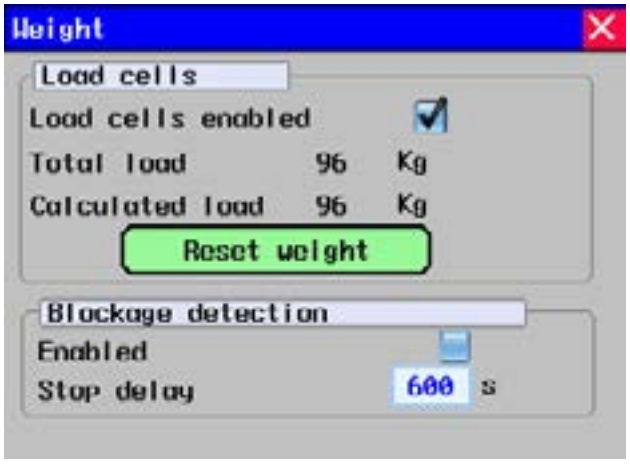
- Enable/disable pulse signal
- Shortest start signal – adjust signal length (circuit diagram -X3:5)
- Shortest stop signal – adjust signal length (circuit diagram -X3:6)

Activation by FeedRobot

When FeedMixer is used together with an external feed cart or wagon, such as a FeedRobot, FeedMixer can be started using a photocell and switch.

- Enable/disable the function
- **Photocell act/deact. delay**
  Photocell activating/diactivating delay – how long the photocell must have a stable signal before FeedMixer reacts.
- **Photocell react. delay**
  Delay until reactivating of photocell – period of time after the end of the feedout process until the next feed may begin.
- **Switch act. delay**
  Switch activation delay – how long Feed Robot must be in the switch position before the feedout process begins.

Switch deact. delay
Switch deactivating delay – time to elapse before FeedMixer stops the feeding process if FeedRobot leaves the position.
See picture 10



Picture 12

5.3.4 Weight settings

Settings for weighing system and weight functions are configured here.

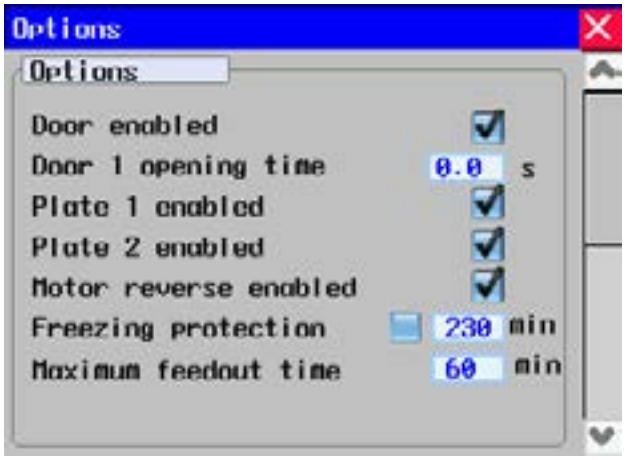
Load cells

- **Load cells enabled** – enable/disable load cells. Without the loading cells it is not possible to display the load, and the functions related to load will not work. It may be appropriate to disable the loading cells during a period when the loading cells are out of order.
- **Total load** – shows the same value as the loading cell amplifier.
  (Box with red numbers)
- **Calculated load** – shows the load of the feed in the FeedMixer.
- **Reset weight** – sets the calculated load to 0. FeedMixer must be completely empty. Hold the key for three seconds to reset.

Blockage detection

This function is used to prevent blockages in the door outlet. If there is no reduction in load of the feed during the feedout process, FeedMixer will stop after the set time and give an alarm.
This function is useful during automatic feedout when a connected machine may lead to blockages if it stops.

- **Enabled** – Enable/disable this function.
- **Stop delay** – configure the desired time to stop. Should not be shorter then 60 seconds.



Picture 13a

5.3.5 Options

Other settings and enabling/disabling of various functions can be performed here.

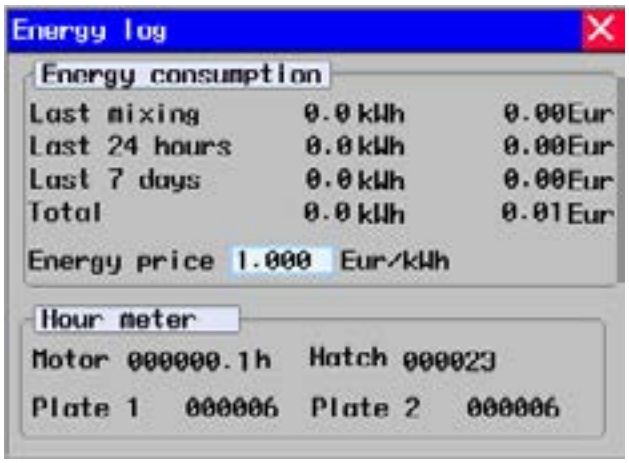
- Door enabled/disabled
  – Enable the door to allow FeedMixer to automatically open/close the door when feeding. If disabled, the door must be controlled manually.
- Door 1 opening time
  – Configure the desired opening height for the door during automatic feedout. Enter opening time in seconds it takes to open the door to the level desired. Enter value 0 and door opens completely.
- Plate 1 or 2 enabled (Counter knife 1 or 2)
  – Enable counter knives to allow FeedMixer to automatically move counter knives in position when mixing and retract them during the feedout process. When counter knives are disabled, they are stationary, and can be moved manually to the desired position.
- Motor reverse enabled/disabled
  – When mixing and feedout, the auger will rotate in reverse approximately a quarter revolution in order to loosen the feed before rotating in the working direction. This avoids overloading the motor on start-up. This function **must be used** when FeedMixer is loaded to the limit.
- Freezing protection enabled/disabled
  – During cold times of year, the feed may freeze to the auger and sides, and make it difficult for the auger to turn. You can prevent feed from freezing to surfaces by setting the auger to turn at defined intervals. Configure the desired interval.
- Maximum feedout time
  – To avoid overload, the maximum feedout-time is limited to 60 minutes. This time can be adjusted as desired.

Move to the next screen using the arrows on the right.

Picture 13b

External alarm input Off / NO / NC
– Used when a connected machine may give an error message. This signal causes FeedMixer to stop. (Connected to -X3:4).
NO – normally open signal
NC – normally closed signal

- **Motor load target for auto speed** – the motor's specified load is entered here as a percentage. This figure is converted to real amperage **(A)**.
  This parameter is used to calculate auto speed during mixing or feedout.
- **Motor overload alarm** – enable / disable – Give an audio alarm when the motor has too heavy load. Do not load any feed until the alarm stops sounding.
- **Auger run time after emptied FeedMixer** – When FeedMixer is completely empty after a feedout, the auger will continue to run for a time. Enter the desired time.


Energy log
Energy consumption
Last mixing 0.0 kWh 0.00Eur
Last 24 hours 0.0 kWh 0.00Eur
Last 7 days 0.0 kWh 0.00Eur
Total 0.0 kWh 0.01Eur
Energy price 1.000 Eur/kWh
Hour meter
Motor 000000.1h Hatch 000023
Plate 1 000006 Plate 2 000006

Picture 14

5.3.6 Energy log

Information about energy consumption and the hour meter can be read here.

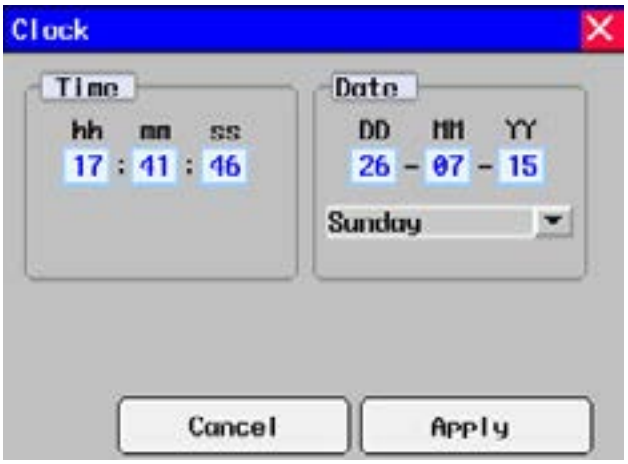
Energy consumption

- FeedMixer calculates the energy consumption of the last mix, over the last 24 hours, the last seven days, and total consumption.

Enter the price of energy in EUR/kW.
FeedMixer calculates the cost of consumption.

Hour meter

- Motor operating time
- Number of times door is opened
- Number of counter knife (Plate) movements in/out



Picture 15

5.3.7 Clock

Time

- Hours hh, minutes mm, seconds ss, adjusted individually.

Date

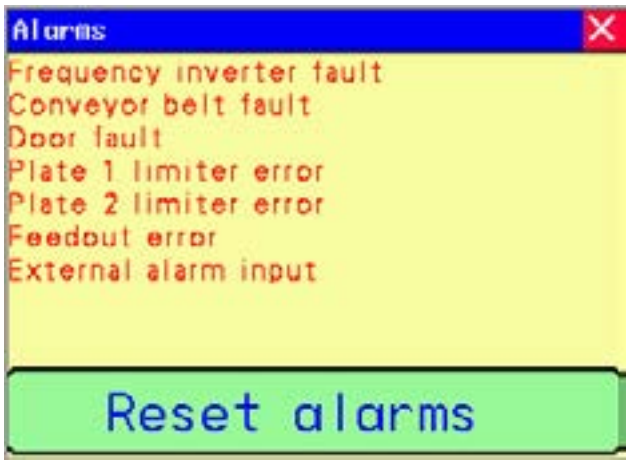
- Day DD, month MM, year YY, adjusted individually.
- Day of the week chosen from the list
- Press **Apply** to save

Picture 16

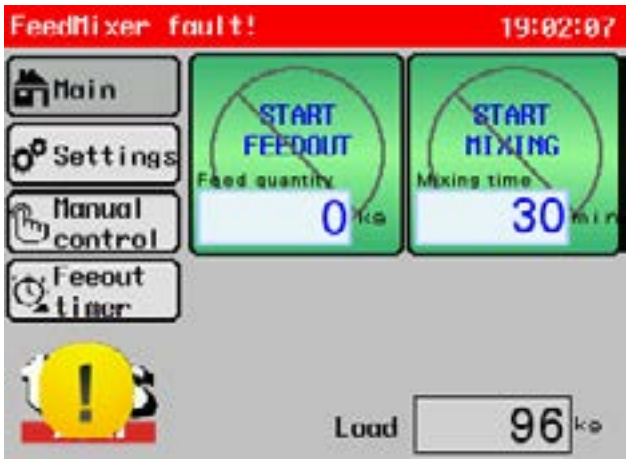
5.3.8 Language

Select display language

5.4 Alarms



Picture 17



Picture 18

FeedMixer stops when an alarm is triggered.
The screen shows the alarm window and which alarm was triggered.
The window can be closed by pressing the X in the upper right-hand corner.
A yellow symbol displays on the Home screen.
Touch the symbol to open the alarm window again.
Reset the alarms using the
Reset alarm key
If the error has not been corrected, the alarm will trigger again shortly

- **The following error messages may display:**
- Frequency inverter fault
- Conveyor fault
- Door fault
- Limit switch fault, counter knife 1 (Plate 1)
- Limit switch fault, counter knife 2 (Plate 2)
- Feedout process fault
- External alarm input

See Chap. 6 Troubleshooting

6 Troubleshooting

Fault	Causes	Procedure – error correction
Auger does not rotate	• *The shear bolt in the bolt-connection in front of the planet gear has sheared.*	• *Replace the shear bolt.*
Weight system, door or conveyor belt not working	• *Voltage too high.* • *Power cut.*	• *Check the fuses.* • *Turn off the mains supply for 30 seconds. Motor, door and counter knives will be reset automatically.*
Scales are showing incorrect values **Scales are not working**	• *The settings on the load cell amplifier are incorrect.*	• *The load cell amplifier must be configured correctly.* ***See Chap. 7***
	• *Augerconnections on the scales' components have come loose.*	• *Retighten the augerconnections.*
	• *The switch is moist.* • *Insufficient contact in cables.*	• *Clean and dry the switch* • *(do not use contact spray).*
Alarm! **Door fault**	• *El. actuator does not reach top or bottom endpoints-within 30 seconds.*	• *Clean the outlet.* • *Check clearance in the slot of the door.*
Alarm! **Fault on limit switch for the counter knifes**	• *Both of the limit switches in the el. actuator give a signal.*	• *Check the cables for faults.*
Alarm! **Frequency inverter fault**	• *Power supply to the motor.* • *Overload/overheating on motor.*	• *Check the power supply.* • *Wait until the engine has cooled.* • *Press Reset alarms to reset the frequency inverter*
Alarm! **Conveyor fault**	• *Power supply to the motor.* • *Overload on motor.*	• *Check the conveyor.* • *Enable motor protection.*
Alarm! **Feed feeding fault**	• *When there is no reduction in weight during the discharging process.* ***See Chap. 5.3.4***	• *Check the door outlet.*
Alarm! **External alarm input**	• *Fault in connected machine.* ***See Chap. 5.3.***	• *Check connected machine.*

7 Maintenance and care

7.1 General safety instructions

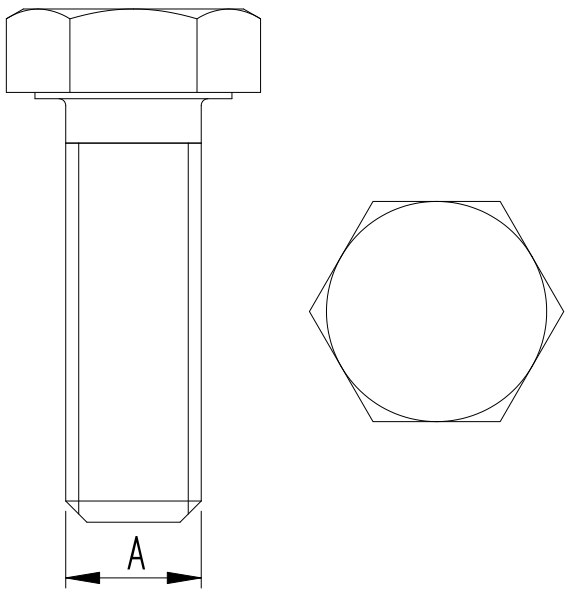
NB:

- Every time the machine is used, it is important to check the condition of the machine, and to ensure that safety equipment is in place if required.
- Make sure that all warning labels are in place and are legible.
- Cleaning, lubrication and adjustments of FeedMixer or the driveshaft must only be performed with the motor and power supply turned off.

- **Recommended procedure:**
- Unaugerthe main switch on the machine. Only authorised personnel may carry out such work.
- Avoid direct skin contact with oil and grease. In the event of personal injury caused by an oil leak, seek medical help immediately!
- Once maintenance and servicing has been completed, take care to refit all guards correctly.
- Check the torque of nuts and bolts initially after five hours of operation and then regularly (approx. every 50 hours of operation).

Retighten if necessary.

7.2 Recommended bolt torque



ICM_23

A	8.8	10.9
	Torque (Nm)	
M 6	10.3	14.71
M 8	25.5	35.3
M10	50.01	70.61
M12	87.28	122.58
M14	135.27	194.17
M16	210.84	299.1
M18	289.3	411.88
M20	411.88	576.5
M22	558.98	748.45
M24	710.99	1000.28

7.3 Cleaning

Clean the machine regularly – and thoroughly when necessary. Dirt attracts moisture and causes rust to form.
After cleaning with a high pressure washer or steam, lubricate all rotating parts thoroughly.

Warning:
Electrical components such as the loading computer, junction box, loading cells and control panel must not be exposed to high pressure from a high pressure washer or steam cleaner.

7.4 FeedMixer – operation

- If FeedMixer is to be left inoperative over a longer period (more than one day), it must be emptied out completely.
- Disconnect the machine from the power supply.
- Clean the inside, outside and bottom of the machine.
- Remove accumulated plant debris.
- Repair paint damage in order to prevent rust. We recommend cleaning the machine as described in the section on maintenance.

NB:
Always disconnect the power supply before inspecting, servicing or repairing the machine.
.

The chapter on cleaning, servicing and maintenance is there for your own safety.

7.5 Shear bolt protection

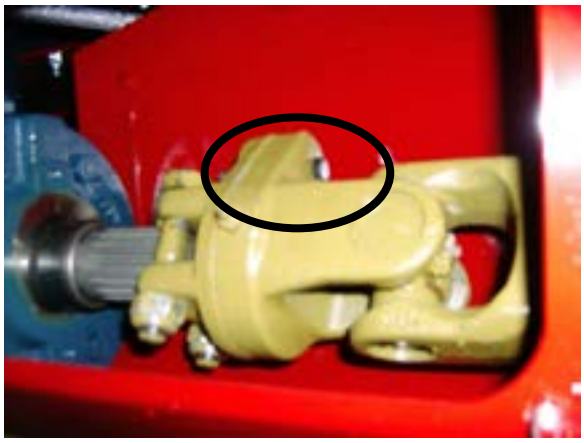


Fig. 20

The gearbox is protected by a shear bolt connection. If the shear bolt shears, the following action should be taken:

- Turn off the motor (turn the main switch to the "OFF" position and secure it).
- Remove the source of the overload, e.g. a foreign object, from FeedMixer.
- Remove the protective cover.
- Remove the remains of the shear bolt.
- Rotate the driveshaft to the connection shaft so that the holes align.
- Replace the shear bolt with a bolt of the same type.

Replace the shear bolt with a break bolt:
Break bolt 10.9 – used on a 45 kW motor or
Break bolt 8.8 – used on a 18–37 kW motor
See Fig. 20

7.6 The auger knives

Fig. 21

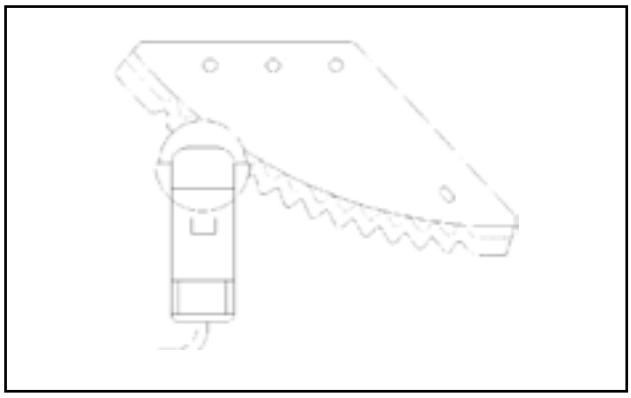


Fig. 22

Important!

Turn off the main switch and secure it before entering the feed mixer.

- The auger knives should be sharpened regularly.
- Blunt knives increase power consumption and mixing times while reducing cutting performance.
- The knives should be checked daily for visual faults.
- Replace damaged and blunt knives immediately.

To sharpen the knives, use an angle grinder with an undulating grinding disc.
Se Fig. 22
The knives must only be sharpened on the smooth side, never on the undulating side. Carefully resharpen the knives so that the blades are not exposed to excessive heat.

Precautions when sharpening knives:

- ### Warning!

- There may be a risk of the knives expelling grinding particles! This can cause serious injury, particularly to the eyes.

- When sharpening the knives, enter the empty feed mixer by stepping over the edge of the hopper.

- Use protective goggles and gloves.

- Carefully sharpen the knives on the smooth side.
- Clean the dust when sharpening is performed.

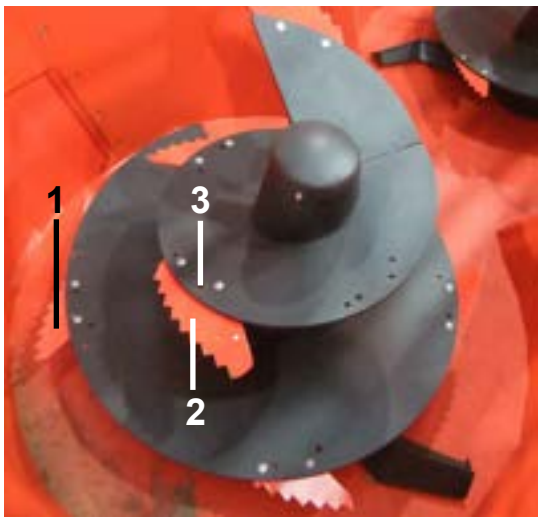


Fig. 23

Remove all foreign objects (tools, etc.) from FeedMixer.
If the blades become discoloured during sharpening:

- Excessive temperatures reduce the lifespan of the knives.

• The blades can be switched from "aggressive" mode **(1)** to "normal" mode **(2)** by reposition knife **(3)**

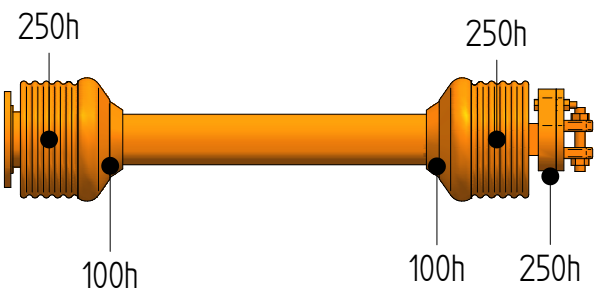
Aggressive = short mixing time, uses more power.
Normal = longer mixing time, uses less power.

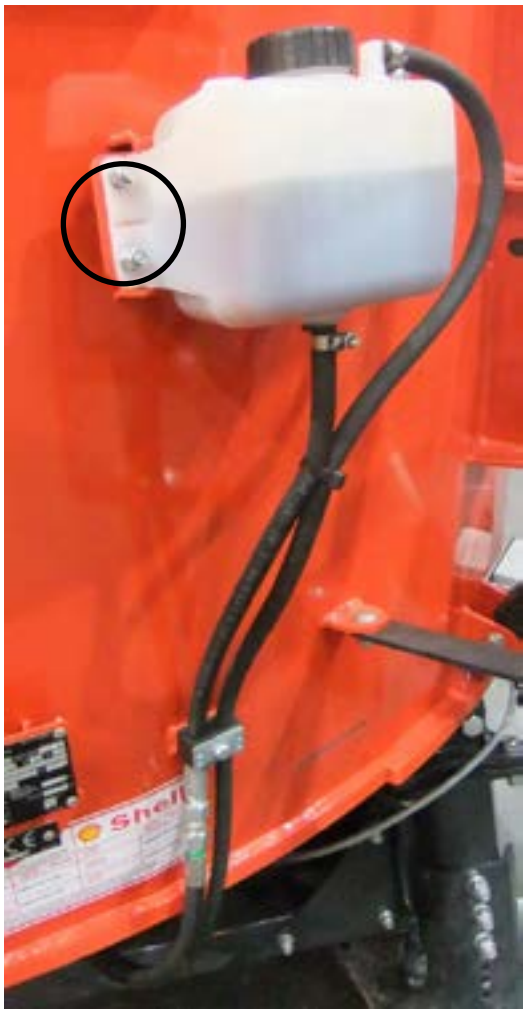
WARNING!

- Exercise caution when fitting sharp knives!
- They can cause serious cuts to fingers and hands.
- Always use protective gloves when working with knives

- **Use the following tools when replacing knives:**
- Two spanners (size 19),
- protective gloves, edge guards for shielding the blades when fitting the knives.

7.7 Lubrication





Lubricating intervals for the main driveshaft are shown in the diagram on the left.
Further information can be found in the user manual published by the driveshaft manufacturer.
See Fig. 24

Oil level

- Always check the oil level when oil is cold.
- During operation the oil grows hot and the level rises.
- See oil level at expansion tank.
  Level shall be at mark.

See Fig. 24

Fig. 24

7.8 Oil change

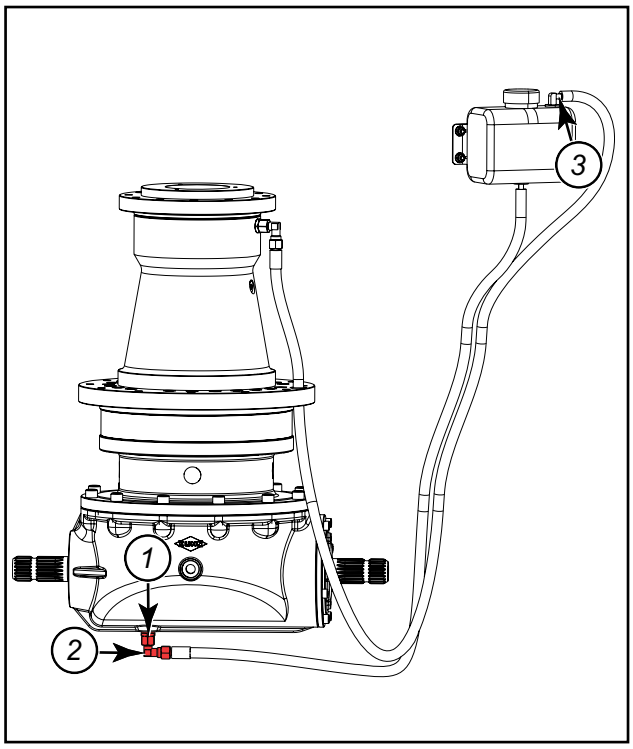


Fig. 25

NB:

Make sure that you do not slip on lubrication oil when draining and refilling the gearbox. Remove all traces of oil from the ground using a suitable product.

The drain plug for the right-angle gearbox is accessible underneath the machine.

- Place a hopper under the gearbox.
- Unscrew all fittings (1) and (2) under the right-angle gearbox.
- Wait until the oil has drained out.
- Disconnect the hose from the expansion tank (3).
- Blow air with a maximum pressure of 0.5 bar (7.3 psi) into the gearbox in order to empty it entirely.
- Fit all fittings (1) and (2) under the right-angle gearbox.

See Fig. 25

Before changing the oil in the right-angle gearbox, run the machine briefly to heat the oil slightly.

It is sound practice – and is also required by law in some countries – to treat wastewater using sedimentation and oil separation, and to practise controlled handover.

7.9 Filling with a pump

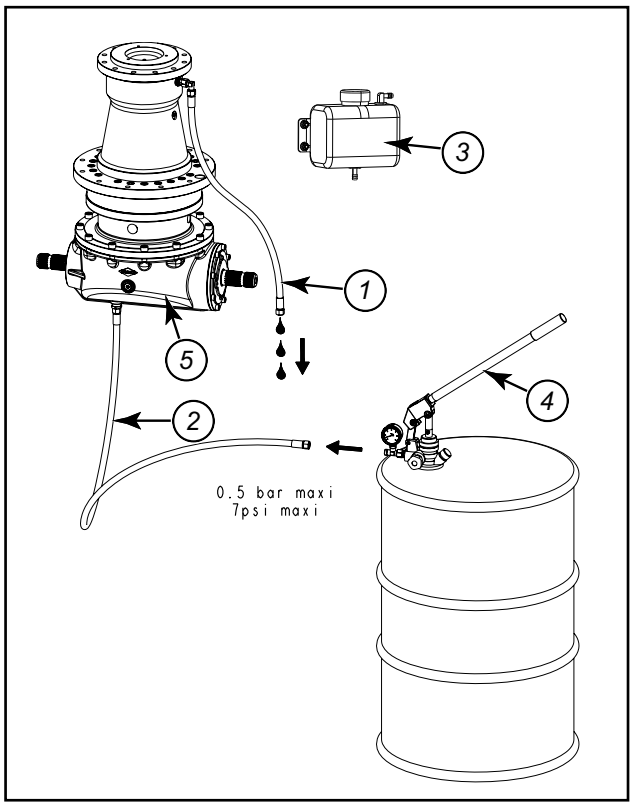


Fig. 26

- Disconnect the two hoses **(1) (2)** that connect the gearbox to the expansion tank **(3).**
- When the right-angle gearbox is empty, empty the hose **(1)** with a maximum pressure of 1 bar (14.5 psi).

NB:
This operation is necessary in order to check that the oil flowing out of the hose **(1)** during filling really is new oil.

Use an oil pump **(4)** to pump oil into the hose **(2)** connected to the bottom of the right-angle gearbox **(5)** until the oil flows out of the second hose **(1).**
See Fig. 26

Pump pressure
The pump pressure must be less than 0.5 bar (7.3 psi) in order to avoid damaging the seals in the right-angle gearbox.

When the oil begins flowing out of the other hose **(1)**, wait a few seconds to be sure that there is no air left in the oil circuit.

Fit the hoses:
The hose under the right-angle gearbox plugs into the bottom of the expansion tank.
The hose at the top of the right-angle gearbox is fitted to the top of the tank.

For machines with two augers, fill the two units separately at the top of the tank.
Fill the tank up to the level marker.

Capacity 21 l (5.5 gal) of oil per gearbox.
Capacity 49 l (12.9 gal) **oil SHELL OMALA 150** for two gearboxes plus the oil in the expansion tank.

7.10 Lubrication table

Description	Recommended lubricant	Corresponding standard
Right-angle gearbox 1 auger 21L + 2,5L =23,5L 2 augers 49L	SHELL OMALA 150	ISO CKC 150/ SAE 80 W 90
Grease	SHELL RETINAX EP2	NLG1

7.11 Oil change gear motor

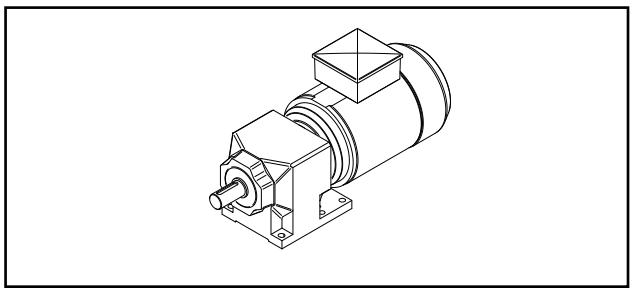


Fig. 27

Gearmotor
Amount 4,0 liter

AGIP	KLUBER	SHELL	MOBIL
Telium VSF 320	Syntheso D220 EP	Tivela Oil WB	Glygoil 30 SHC 630

7.12 Lubricating the power transmission shaft

Fig. 28

- Remove the protective cone **(1)**.
- Pull the protective cone **(2)** backwards.
- Lubricate the shaft and break pin, cross 250h
- Refit the protection 100 h **(3)**.
- Turn the protective cone until it snaps into place **(4).**
- Press firmly to connect **(5).**
- Make sure the protective pipe is properly fitted **(6).**

See Fig. 28

Read and follow the instructions in the user manual included with the power transmission shaft.

8 Loading cell amplifier

OPERATION OF THE LOADING CELL AMPLIFIER

Remove the cover. Three switches on the right of the **LED** display labelled
UP arrow, **DOWN** arrow and **ENTER** are used for programming.
UP and **DOWN**: Change parameter
ENTER accepts the data/exits the function.
Press **ENTER** briefly and select a function using UP and DOWN.
ENTER opens the function you are currently on. UP or DOWN changes the parameter.
ENTER confirms the parameter.

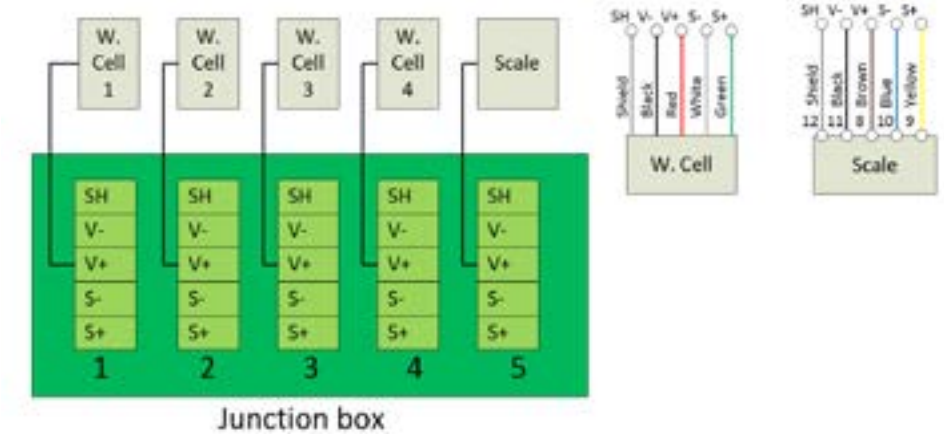
PROGRAM LOADING CELL AMPLIFIER:

1) Enable parameter 23 and enter the number of loading cells: 3 or 4
2) Enable parameter 24 and set the value to 0.825
3) Enable parameter 32 and set the value to 0
4) Enable parameter 34 and set the value to "U"
5) Enable parameter 20 and set the value to the appropriate load in kg. (0 if empty)

Default setup (factory settings) is enabled using function 70.
Function 70 is protected by a code: the code is 71.

1. Select function 70 using the UP/DN keys and finish using the ENT key.
2. Select function 71 using the UP/DN keys and finish using the ENT key.

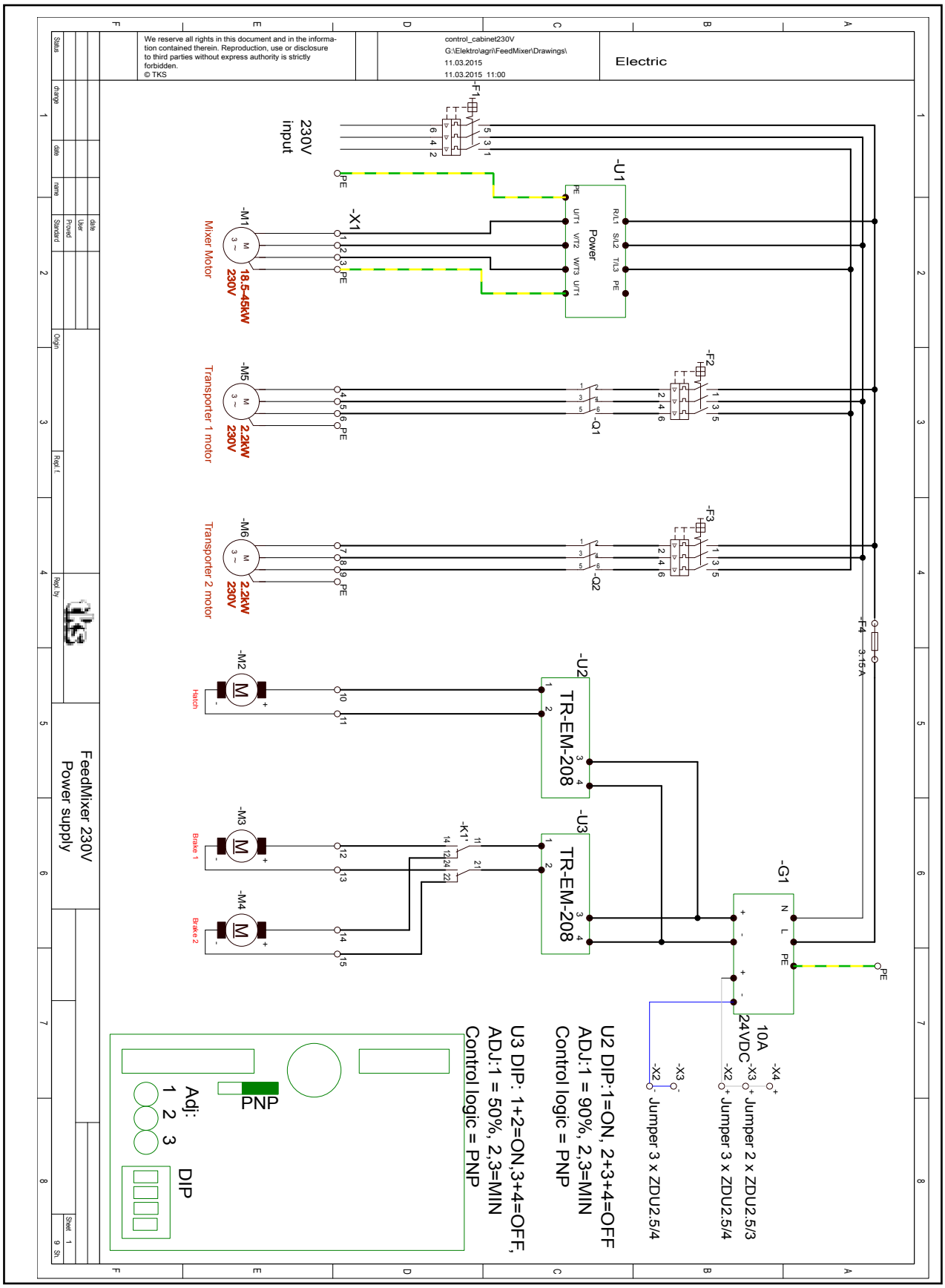
Once the function has completed, four horizontal lines appear briefly on the display.



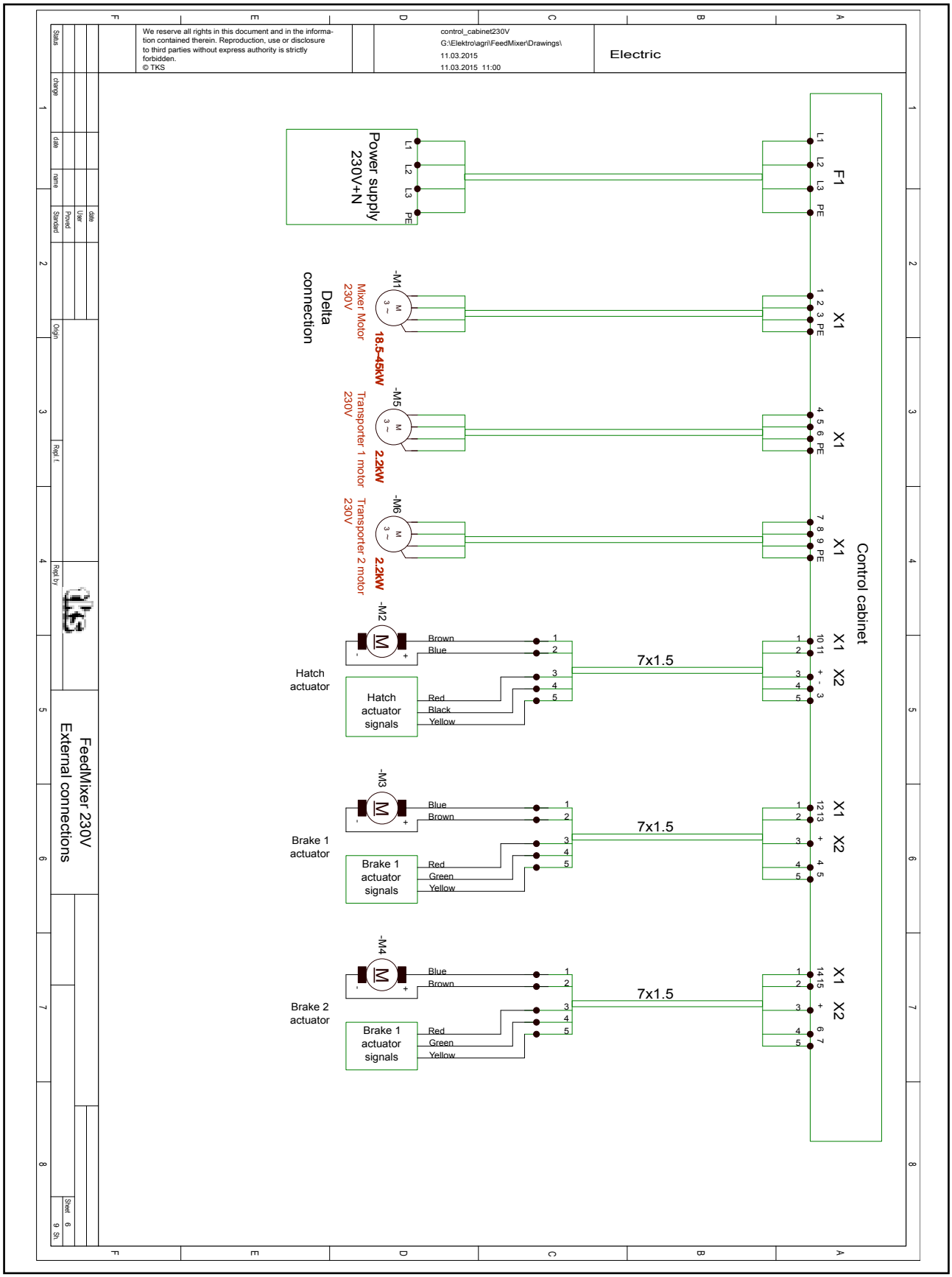
PTM junction box
Plug/pin assignment:
A: Yellow -> Signal -
B: White -> Supply +
C: Red -> Signal +
D: Green -> supply
E: Guarding

Moba junction box
Plug/pin assignment:
A: Green -> Signal -
B: Yellow -> Supply +
C: White -> Signal +
D: Brown -> Supply
E: Guarding

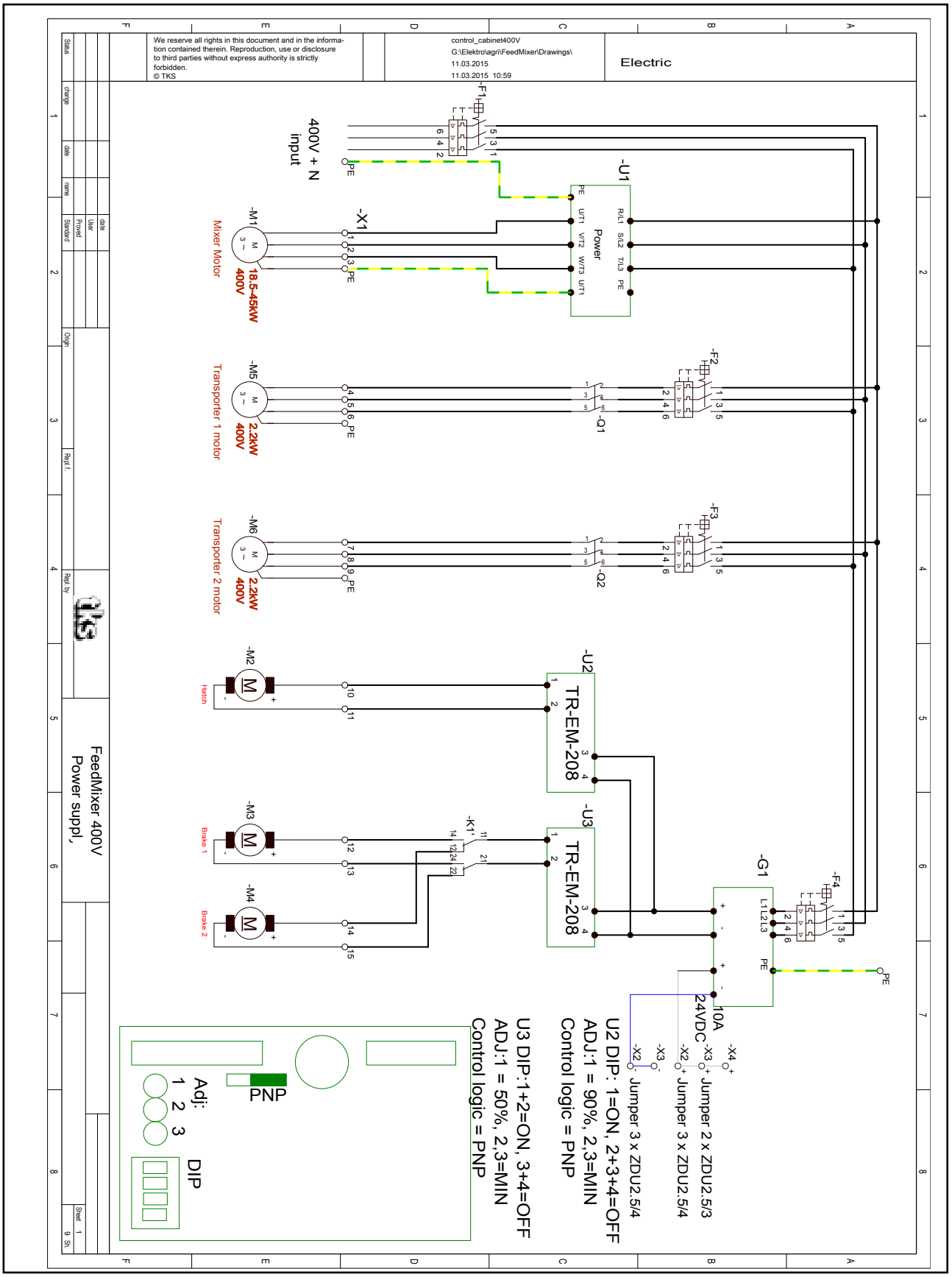
9 Circuit diagram – Power supply 230V



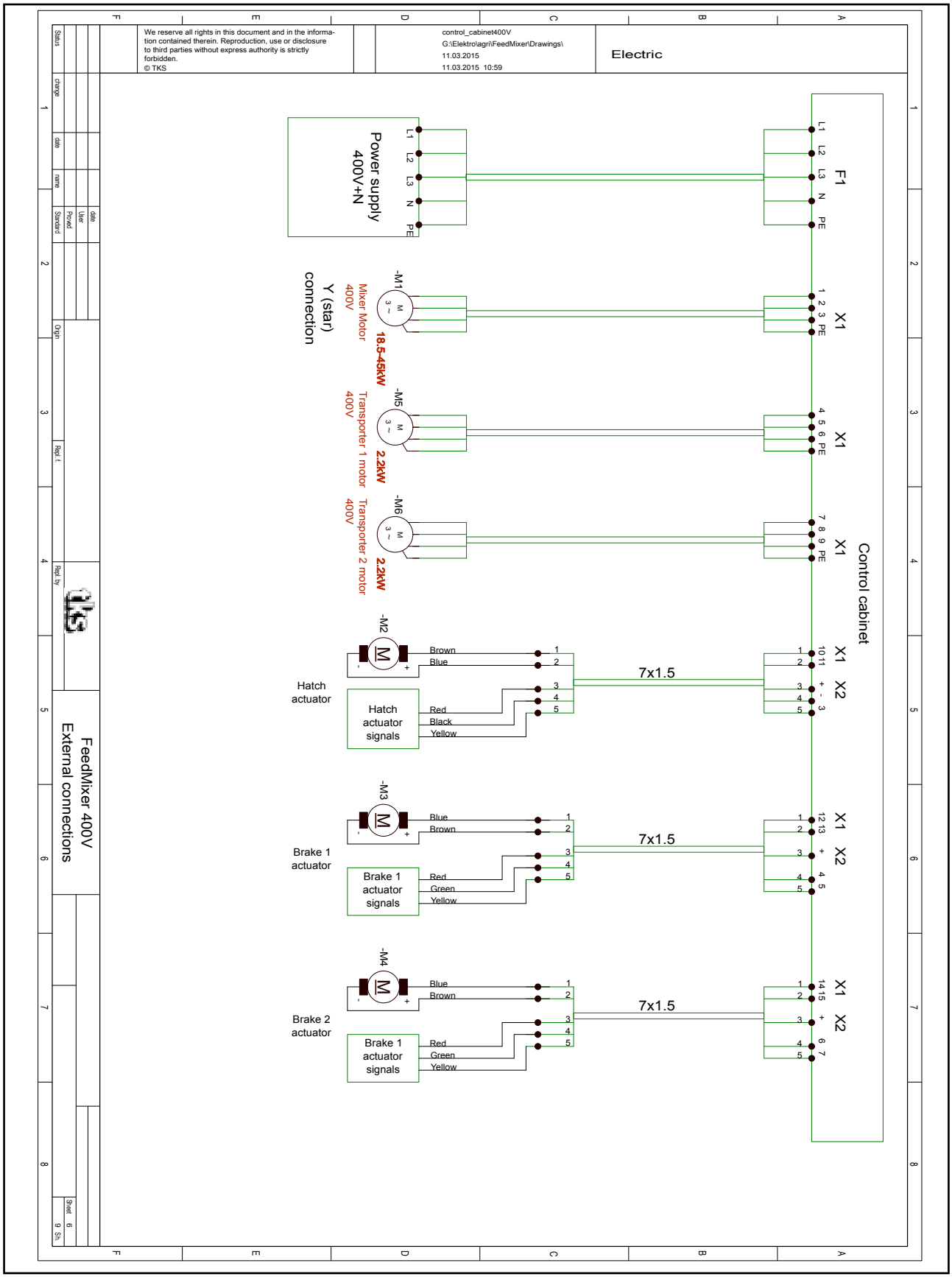
Circuit diagram – External connections 230V



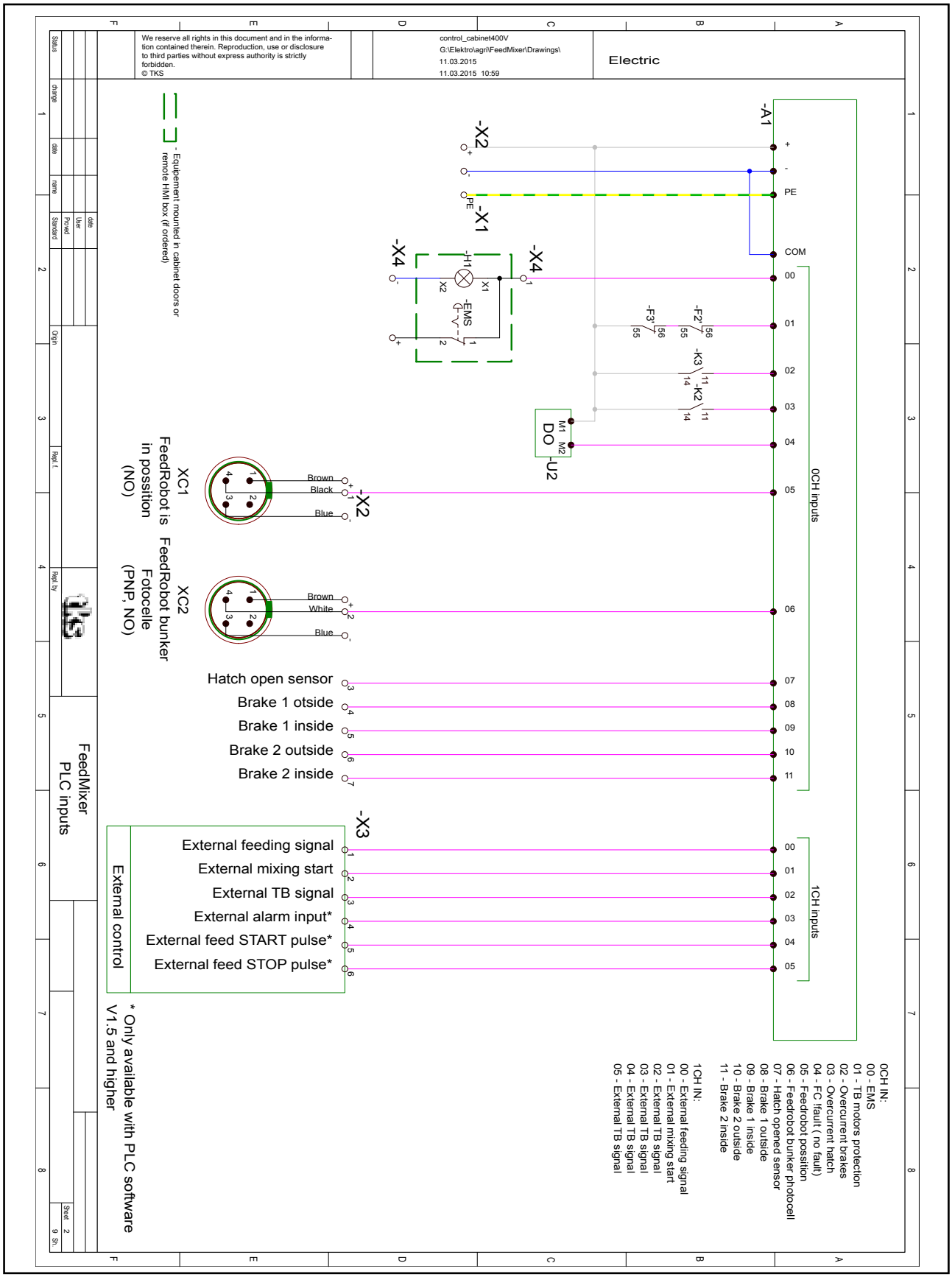
Circuit diagram – Power supply 400V



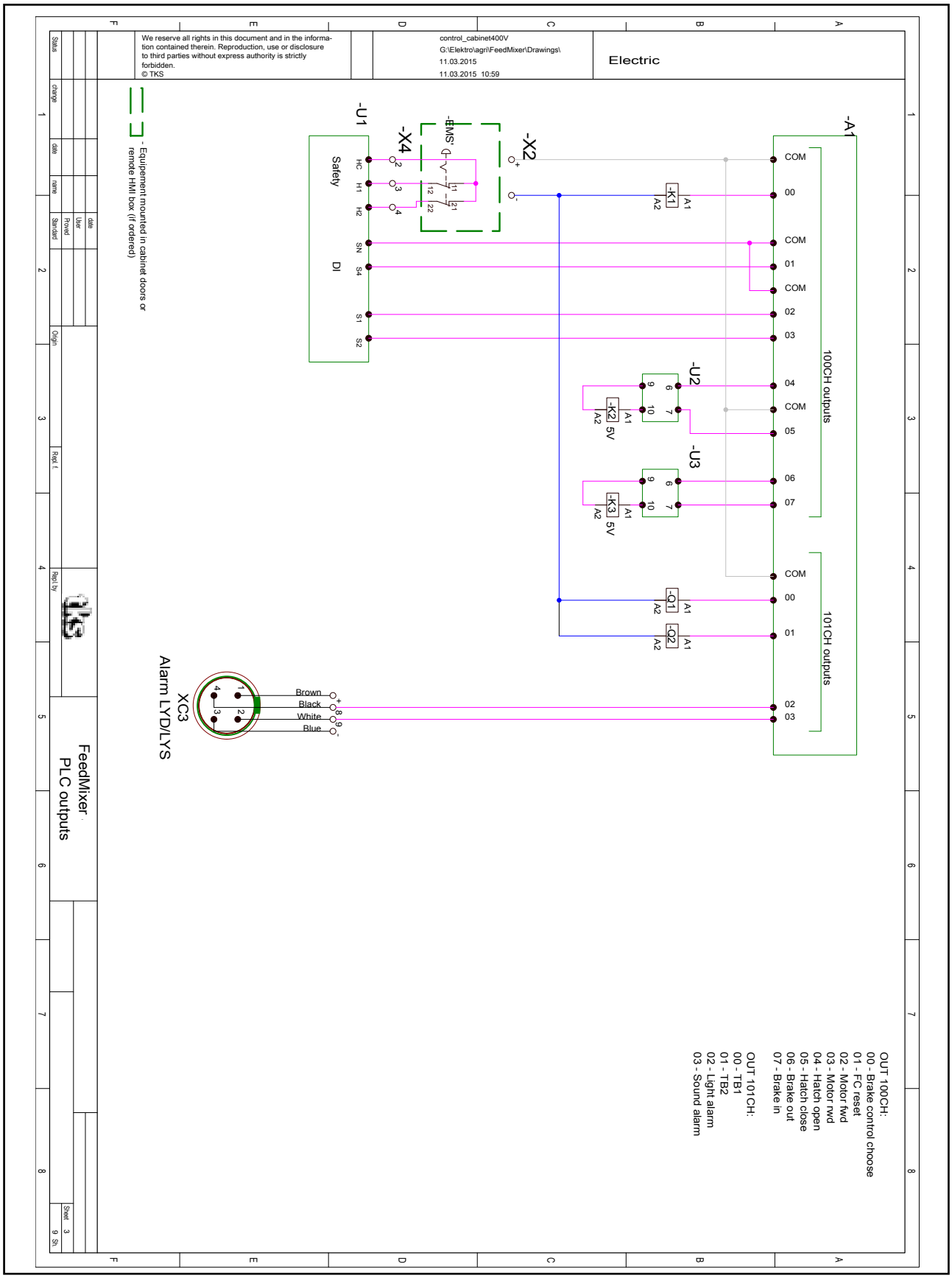
Circuit diagram - External connections 400V



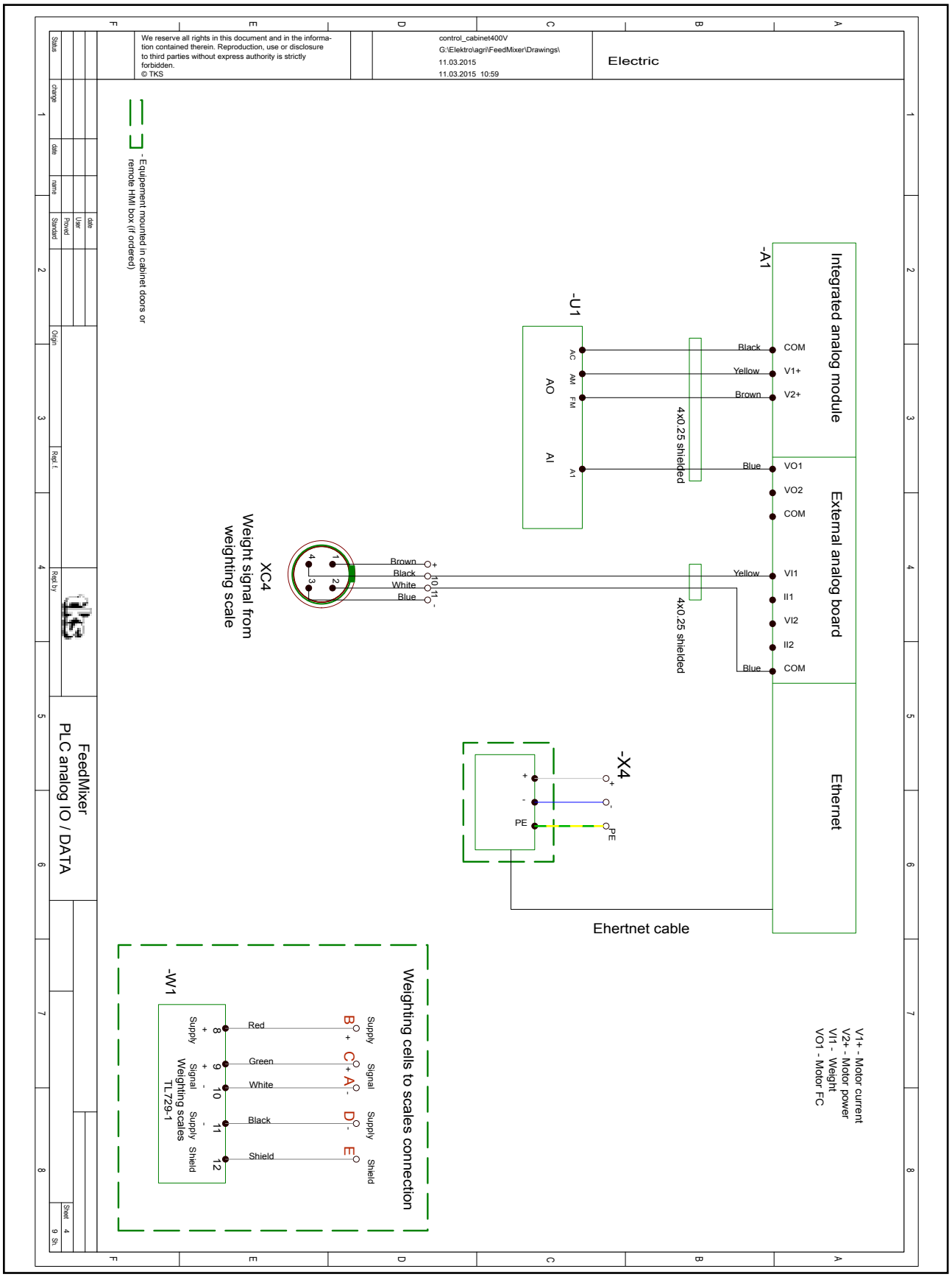
Circuit diagram - PLS inputs



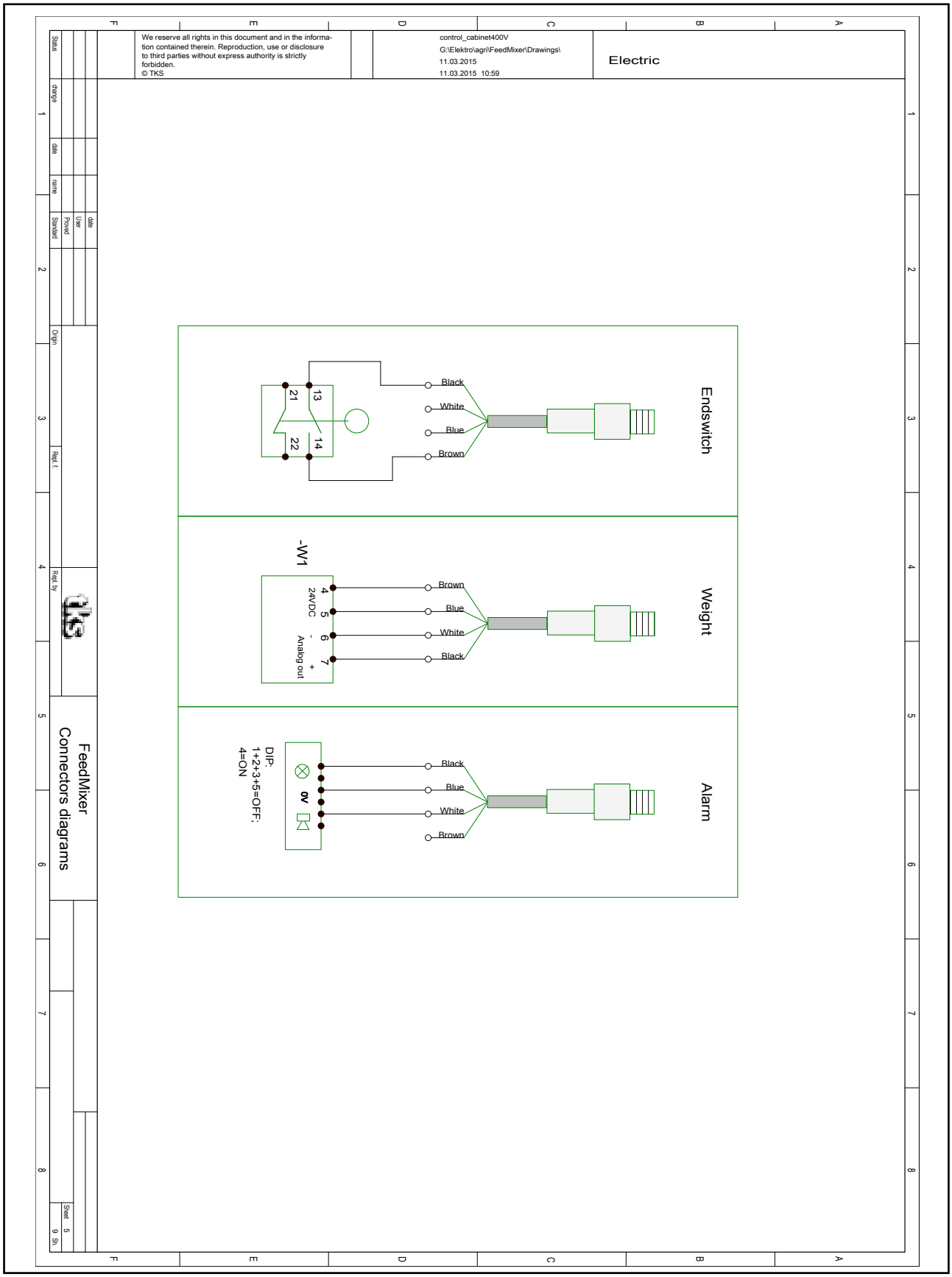
Circuit diagram - PLS outputs



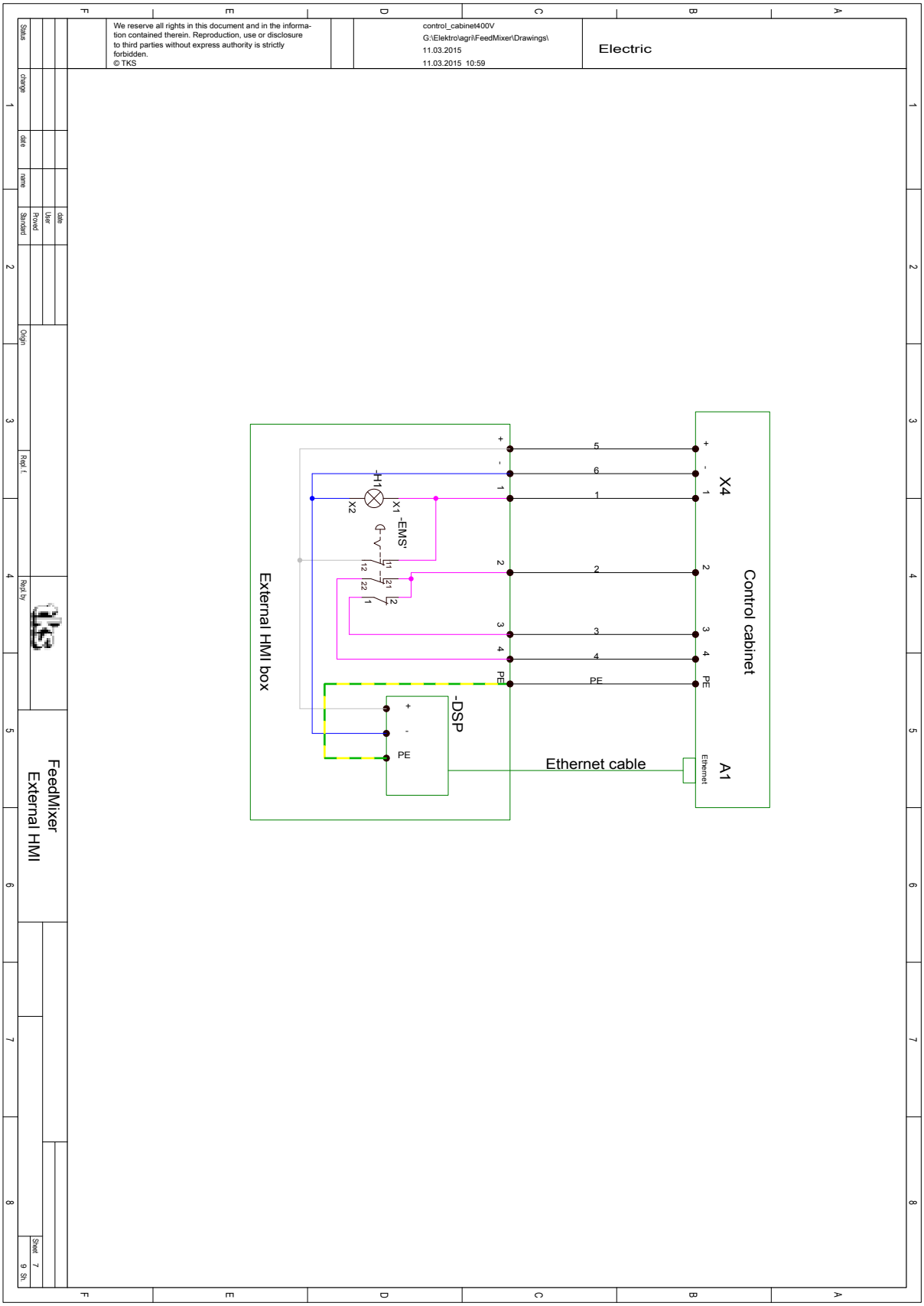
Circuit diagram - analog IO / DATA



Circuit diagram – Connectors diagrams



Circuit diagram - External HMI



Warranty form

TKS Kuhn FeedMixer

Owner : _____
Adress: _____
Post adress: _____

Sales Company : _____ *Name of sales rep :* _____
Department: _____ *Name of fitter :* _____
Dato of sale : _____ *Order no. :* _____
Date of commisioning : _____

An instructor/fitter who represents the sales company and the owner/user of the equipment must jointly go through these points from the user manual before the equipment is used.

Tick off if OK:

	Have danger zones, crushing risks and the way in which the machine is operated been
	Have all safety instructions for the machine been read and reviewed?
	Has the main circuit protection been adjusted according to the size of the motor?
	Has the use of the machine been reviewed jointly (fitter/user) during the commissioning
	Have fixed routines for maintenance and inspection of the Kuhn FeedMixer been established?

It is hereby confirmed that the user manual has been followed and reviewed.
Training is confirmed as approved by the users and owner.

Signature of owner and user:

_____

_____

E-mail:_____

Dealer's representative:

_____

_____

E-mail:_____

The TKS warranty provisions will only apply when the quality control has been documented as having been completed.A copy must be sent to TKS and the sales rep.

Warranty form

TKS Kuhn FeedMixer

Owner : _____
Adress: _____
Post adress: _____

Sales Company : _____ *Name of sales rep :* _____
Department: _____ *Name of fitter :* _____
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_____

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Dealer's representative:

_____

_____

E-mail:_____

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Notes

TKS is a family owned company with a strong brand name. We are providing our customers with a unique and complete range of high quality products.

www.tks-as.no

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